Boehringer Ingelheim

Clinical Trial Protocol

	Document Number: **c38906736-02**
EudraCT No.	2022-002249-16
BI Trial No.	1305-0033
BI Investigational Medicinal Product	BI 1015550
Title	The effect of multiple oral doses of BI 1015550 on metabolism of midazolam administered orally in healthy male subjects (open-label, two-period fixed sequence design trial)
Lay Title	A study in healthy men to test whether BI 1015550 influences the amount of midazolam in the blood
Clinical Phase	I
Clinical Trial Leader	[redacted] Phone: [redacted] Fax: [redacted]
[redacted] **Investigator**	[redacted] Phone: [redacted] Fax: [redacted]
Current Version, Date	Version 2.0, 23 Sep 2022
Original Protocol Date	04 Aug 2022

CLINICAL TRIAL PROTOCOL SYNOPSIS

Company name	Boehringer Ingelheim
Original protocol date	04 Aug 2022
Revision date	23 Sep 2022
BI trial number	1305-0033
Title of trial	The effect of multiple oral doses of BI 1015550 on metabolism of midazolam administered orally in healthy male subjects (open-label, two-period fixed sequence design trial)
[redacted] **Investigator**	[redacted]
Trial site	[redacted]
Clinical phase	I
Trial rationale	In order to assess the potential impact of steady state BI 1015550 on CYP3A clinically, the effect of BI 1015550 on the midazolam pharmacokinetics will be evaluated. Midazolam is a recommended substrate of CYP3A4.
Trial objective	The main objective is to investigate the induction effect of multiple oral doses of 18 mg of BI 1015550 bid (twice daily) on the pharmacokinetics of a single oral dose of midazolam
Trial endpoints	Primary endpoints: AUC_{0-tz} and C_{max} of midazolam Secondary endpoints: $AUC_{0-\infty}$ of midazolam
Trial design	Open-label, two-period fixed sequence design trial
Number of subjects **total entered** **on each treatment**	 15 15
Diagnosis	Not applicable
Main inclusion criteria	Healthy male subjects, age of 18 to 55 years (inclusive), body mass index (BMI) of 18.5 to 29.9 kg/m2 (inclusive)
Test product 1 **dose** **mode of admin.**	BI 1015550, 18 mg film-coated tablets 18 mg bid (= 2 x 1 tablet of BI 1015550) Oral with 240 mL of water
Test product 2 **dose** **mode of admin.**	Midazolam-[redacted]2 mg/ml oral solution 2 mg single dose (= 1 x 1 ml of midazolam) Oral with 240 mL of water

Duration of treatment	Treatment Reference (R): 1 x 1 ml midazolam solution on Day 1 of period 1 Treatment Test (T): 1 tablet of BI 1015550 twice daily (bid) for 13 days (Day -13 to Day -1 of period 2) and only the morning dose (qd) on Day 1 of period 2 together with 1 ml midazolam oral solution
Statistical methods	The effect of steady state BI 1015550 on metabolism of midazolam will be estimated by the ratios of the geometric means (T/R) for the primary and secondary endpoints. Additionally, their two-sided 90% confidence intervals (CIs) will be provided. This method corresponds to the two one-sided t-test procedure, each at a 5% significance level. Since the main focus is on estimation and not testing, a formal hypothesis test and associated acceptance range is not specified. The statistical model will be an analysis of variance (ANOVA) on the logarithmic scale including effects for 'subject' and 'treatment', with 'subject' as random and 'treatment' as fixed effect. CIs will be calculated based on the residual error from the ANOVA. Descriptive statistics will be calculated for all endpoints.

FLOW CHART

Period	Visit	Day	Planned time (relative to midazolam intake [h:min]	Approximate clock time of actual day [h:min]	Event and comment	Safety laboratory[7]	PK blood BI 1015550[11]	PK blood Midazolam[11]	[redacted]	Depression, Anxiety and Suicidality assessment[15]	ECG[12]	Vital signs (BP, PR, body weight)[13]	Questioning for AEs and concomitant therapy[6]
SCR	1	-21 to -1			Screening (SCR)[1]	A				x	x	x	
1 (Treatment Reference)	2	1	-1:00	07:00	Admission to trial site[9,16]	x[2,5]		x[2]				x[2,17]	x[2]
			0:00	08:00	Midazolam administration								
			0:30	08:30				x					
			1:00	09:00				x					
			1:30	09:30				x					
			2:00	10:00	240 mL fluid intake			x					
			3:00	11:00				x					
			4:00	12:00	240 mL fluid intake, Lunch[3]			x					
			6:00	14:00				x					
			8:00	16:00	Snack (voluntary)[3]			x					
			10:00	18:00				x					
			11:00	19:00	Dinner								
			12:00	20:00	Discharge from trial site[10]			x				x[19]	x
Washout of at least 24 h													
2 (Treatment Test)	3	-13	-313:00	07:00	Admission to trial site[9,10,16]	B[2,5]	x[2]	x[2]		x[2]	x[2]	x[2,17]	x[2,18]
			-312:00	08:00	BI 1015550 administration								
			-311:30	08:30			x						
			-311:00	09:00			x						
			-310:30	09:30			x						
			-310:00	10:00	240 mL fluid intake		x						
			-309:00	11:00			x						
			-308:00	12:00	240 mL fluid intake, Lunch[3]		x						
			-306:00	14:00			x						
			-304:00	16:00	Snack (voluntary)[3]		x						
			-302:00	18:00			x						
			-301:00	19:00	Dinner								
			-300:00	20:00	BI 1015550 administration		x[8]						
		-12	-288:00	08:00	BI 1015550 administration								x[2,18]
			-276:00	20:00	BI 1015550 administration								
		-11	-264:00	08:00	BI 1015550 administration							x[2]	x[2,18]
			-252:00	20:00	BI 1015550 administration								
		-10	-240:00	08:00	BI 1015550 administration	B[2]	x[8]						x[2,18]
			-228:00	20:00	BI 1015550 administration								
		-9	-216:00	08:00	BI 1015550 administration							x[2]	x[2,18]
			-204:00	20:00	BI 1015550 administration								
		-8	-192:00	08:00	BI 1015550 administration		x[8]						x[2,18]
			-180:00	20:00	BI 1015550 administration								
		-7	-168:00	08:00	BI 1015550 administration		x[8]					x[2]	x[2,18]
			-156:00	20:00	BI 1015550 administration								
		-6	-144:00	08:00	BI 1015550 administration	B[2]							x[2,18]
			-132:00	20:00	BI 1015550 administration								
		-5	-120:00	08:00	BI 1015550 administration		x[8]			x[2]	x[2]	x[2]	x[2,18]

Period	Visit	Day	Planned time (relative to midazolam intake [h:min]	Approximate clock time of actual day [h:min]	Event and comment	Safety laboratory[7]	PK blood BI 1015550[11]	PK blood Midazolam[11]	[redacted]	Depression, Anxiety and Suicidality assessment[15]	ECG[12]	Vital signs (BP, PR, body weight)[13]	Questioning for AEs and concomitant therapy[6]
			-108:00	20:00	BI 1015550 administration								
		-4	-96:00	08:00	BI 1015550 administration								x[2,18]
			-84:00	20:00	BI 1015550 administration								
		-3	-72:00	08:00	BI 1015550 administration		x[8]					x[2]	x[2,18]
			-60:00	20:00	BI 1015550 administration								
		-2	-48:00	08:00	BI 1015550 administration								x[2,18]
			-36:00	20:00	BI 1015550 administration								
		-1	-24:00	08:00	BI 1015550 administration		x[8]					x[2]	x[2,18]
			-12:00	20:00	BI 1015550 administration								
		1	0:00	08:00	BI 1015550 + midazolam administration	B[2]	x[8]	x[8]		x[2]	x[2]	x[2,17]	x[2,18]
			0:30	08:30			x	x					
			1:00	09:00			x	x					
			1:30	09:30			x	x					
			2:00	10:00	240 mL fluid intake		x	x					
			3:00	11:00			x	x					
			4:00	12:00	240 mL fluid intake, Lunch[3]		x	x					
			6:00	14:00			x	x					
			8:00	16:00	Snack (voluntary)[3]		x	x					
			10:00	18:00			x	x					
			11:00	19:00	Dinner								
			12:00	20:00			x	x					
		2	24:00	08:00	Breakfast[3], discharge from trial site		x	x		x[2]	x[2]	x[2,17]	x[2,18]
		3	48:00	08:00	Ambulatory visit		x						x
		4	72:00	08:00	Ambulatory visit		x						x
		5	96:00	08:00	Ambulatory visit		x						x
		6	120:00	08:00	Ambulatory visit		x						x
FU	4	8-15			End of study (EoS) examination[4]	C				x	x	x	x[18]

1. Subject must be informed and written informed consent obtained prior to starting any screening procedures. Screening procedures include physical examination, depression & anxiety assessment, suicidality assessment, check of vital signs, ECG, safety laboratory (including drug screening), demographics (including determination of body height and weight, smoking status and alcohol history), relevant medical history, concomitant therapy and review of inclusion/exclusion criteria.
2. The time is approximate; the procedure is to be performed and completed within 3 h prior to drug administration (or within 3 h prior to discharge on Day 2 of Visit 3).
3. If several actions are indicated at the same time, the intake of meals will be the last action.
4. At the end of study (synonym for end of trial), the EoS examination includes physical examination, depression & anxiety assessment, suicidality assessment, vital signs, ECG, safety laboratory, recording of AEs and concomitant therapies.
5. Urine drug screening and alcohol breath test will be done at this time.
6. AEs and concomitant therapies will be recorded throughout the trial but will be specifically asked for at the times indicated in the Flow Chart above.
7. Letters A, B and C define different sets of safety laboratory examinations (for details refer to Section 5.2.3).
8. To be done within 30 min prior to dosing of BI 1015550.
9. Admission to trial site in the preceding evening is possible and should not be later than 10 h prior to drug administration.

10. At discretion of the investigator or designee, subjects may stay on Day 1 of Visit 2 overnight at the trial site, and on the next day proceed to Day -13 of Visit 3.
11. For details of PK blood sampling, refer to Section 5.3.2.
12. For details of 12-lead ECG, refer to Section 5.2.4.
13. For details of vital signs evaluation, refer to Section 5.2.2.
[redacted]
15. For details of suicidality assessment, depression and anxiety assessment, refer to Section 5.2.5.1 and 5.2.5.2.
16. PCR test for SARS-COV-2/ COVID-19 will be performed (if needed due to the current status of the pandemic) at screening and shortly (within 72 hours) before admission to trial site in each treatment period (or only before admission in Treatment Period 1 if point 10 (see above) is applied and a subject stays at the trial site overnight and not discharged between treatment periods).
17. Including assessment of body temperature (if needed due to the current status of the pandemic).
18. Vasculitis assessment: the investigator shall watch out for events suspicious of vasculitis without alternate cause, refer to Section 5.2.5.3.
19. Measurement of body weight is not required at the indicated time point.

TABLE OF CONTENTS

ABBREVIATIONS AND DEFINITIONS

ADME	Absorption, distribution, metabolism, and excretion
AE	Adverse event
AESI	Adverse events of special interest
ALT	Alanine aminotransferase
ANOVA	Analysis of variance
AST	Aspartate aminotransferase
AUC	Area under the curve
$AUC_{0-\infty}$	Area under the concentration-time curve of the analyte in plasma over the time interval from 0 extrapolated to infinity
[redacted]	[redacted]
AUC_{0-tz}	Area under the concentration-time curve of the analyte in plasma over the time interval from 0 to the last quantifiable data point
BA	Bioavailability
BI	Boehringer Ingelheim
bid	Twice a day
BMI	Body mass index (weight divided by height squared)
BP	Blood pressure
CA	Competent authority
CI	Confidence interval
CL	Total clearance of the analyte in plasma after intravascular administration
[redacted]	[redacted]
C_{max}	Maximum measured concentration of the analyte in plasma
CNS	Central Nervous System
COPD	Chronic obstructive pulmonary disease
COVID-19	SARS-CoV-2 induced disease
CRF	Case Report Form, paper or electronic (sometimes referred to as 'eCRF')
C-SSRS	Columbia Suicide Severity Rating Scale
CT Leader	Clinical Trial Leader
CT Manager	Clinical Trial Manager
CTP	Clinical trial protocol
CTR	Clinical trial report
CV	Arithmetic coefficient of variation
CYP	Cytochrome P450
DDI	Drug Drug Interaction

DILI	Drug induced liver injury
ECG	Electrocardiogram
eCRF	Electronic case report form
eDC	Electronic data capture
EDTA	Ethylenediaminetetraacetic acid
EFD	Embryo-fetal development
EoS	End of Study (synonym for End of Trial)
ESR	Erythrocyte Sedimentation Rate
EudraCT	European Clinical Trials Database
FDA	Food and Drug Administration
FEED	Fertility and early embryonic development
FU	Follow-up
FVC	Forced vital capacity
GCP	Good Clinical Practice
gCV	Geometric coefficient of variation
GI	Gastro-intestinal
gMean	Geometric mean
[redacted]	[redacted]
HR	Heart rate
IB	Investigator's brochure
ICH	International Council for Harmonisation
IGRA	Interferon Gamma Release Assays
IEC	Independent Ethics Committee
ILD	Interstitial lung disease
IPD	Important protocol deviation
IPF	Idiopathic pulmonary fibrosis
IRB	Institutional Review Board
ISF	Investigator site file
[redacted]	[redacted]
LC-MS/MS	Liquid chromatography with tandem mass spectrometry
LOAEL	Lowest observed adverse effect Level
MDA	Methylenedioxyamphetamine
MDMA	Methylenedioxymethamphetamine
MedDRA	Medical Dictionary for Regulatory Activities
MRD	Multiple-rising dose
[redacted]	[redacted]
NOAEL	No observed adverse effect level
NOEL	No observable effect level

PD	Pharmacodynamic(s)
[redacted]	[redacted]
PK	Pharmacokinetic(s)
PKS	Pharmacokinetic set
PR	Pulse rate
qd	Once a day
QT	Peak-trough swing
QT interval	ECG interval from the start of the QRS complex to the end of the T wave
QTc interval	QT interval corrected for heart rate, e.g. using the method of Fridericia (QTcF) or Bazett (QTcB)
R	Reference treatment
REP	Residual effect period
SAE	Serious adverse event
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
SCR	Screening
SmPC	Summary of Product Characteristics
SOP	Standard operating procedure
[redacted]	[redacted]
T	Test product or treatment
[redacted]	[redacted]
TB	Tuberculosis
TBA	Trial Bioanalyst
[redacted]	[redacted]
TS	Treated set
TSAP	Trial statistical analysis plan
ULN	Upper limit of normal
[redacted]	[redacted]
WOCBP	Women of child-bearing potential

1. INTRODUCTION

BI 1015550, [redacted] is being developed by Boehringer Ingelheim (BI) for the treatment of idiopathic pulmonary fibrosis (IPF) and other forms of progressive pulmonary fibrosis.

1.1 MEDICAL BACKGROUND

Idiopathic Pulmonary Fibrosis is a specific form of chronic, progressive fibrosing interstitial pneumonia of unknown cause, occurring primarily in older adults, limited to the lungs, and associated with the histopathologic and/or radiologic pattern of usual interstitial pneumonia (UIP) [P11-07084]. While IPF is considered a prototypical form of progressive pulmonary fibrosis, there is a group of patients with different underlying clinical interstitial lung disease (ILD) diagnoses who develop a phenotype similar to patients with IPF during the course of their disease [P17-10582, P18-04729, P19-01738, R19-0854, P20-01299], which is characterised by increasing extent of pulmonary fibrosis on imaging, declining lung function, worsening respiratory symptoms and quality of life despite disease management considered appropriate in clinical practice, and, ultimately, early mortality [P17-10582, P18-04729, P19-01738, R19-0854, P20-01299].

Nintedanib and pirfenidone are the only drugs registered for the treatment of IPF and both treatments are recommended in the recent ATS/ERS/JRS/ALAT Clinical Practice Guideline for the Treatment of Idiopathic Pulmonary Fibrosis [P15-07539]. Nintedanib is also registered for the treatment of adults with other chronic fibrosing ILDs with a progressive phenotype and Systemic Sclerosis-associated ILD. However, despite existing treatment, there remains a high unmet need for new treatments for IPF and other fibrosing ILDs that have greater efficacy and fewer side effects than existing therapies [P18-06345].

BI 1015550 is an oral preferential inhibitor of the PDE4B with broad anti-inflammatory and antifibrotic activities. Based on its mode of action, as well as available pre-clinical and clinical data, BI 1015550 is hypothesised to have complementary activity to current therapies in IPF and other forms of progressive pulmonary fibrosis.

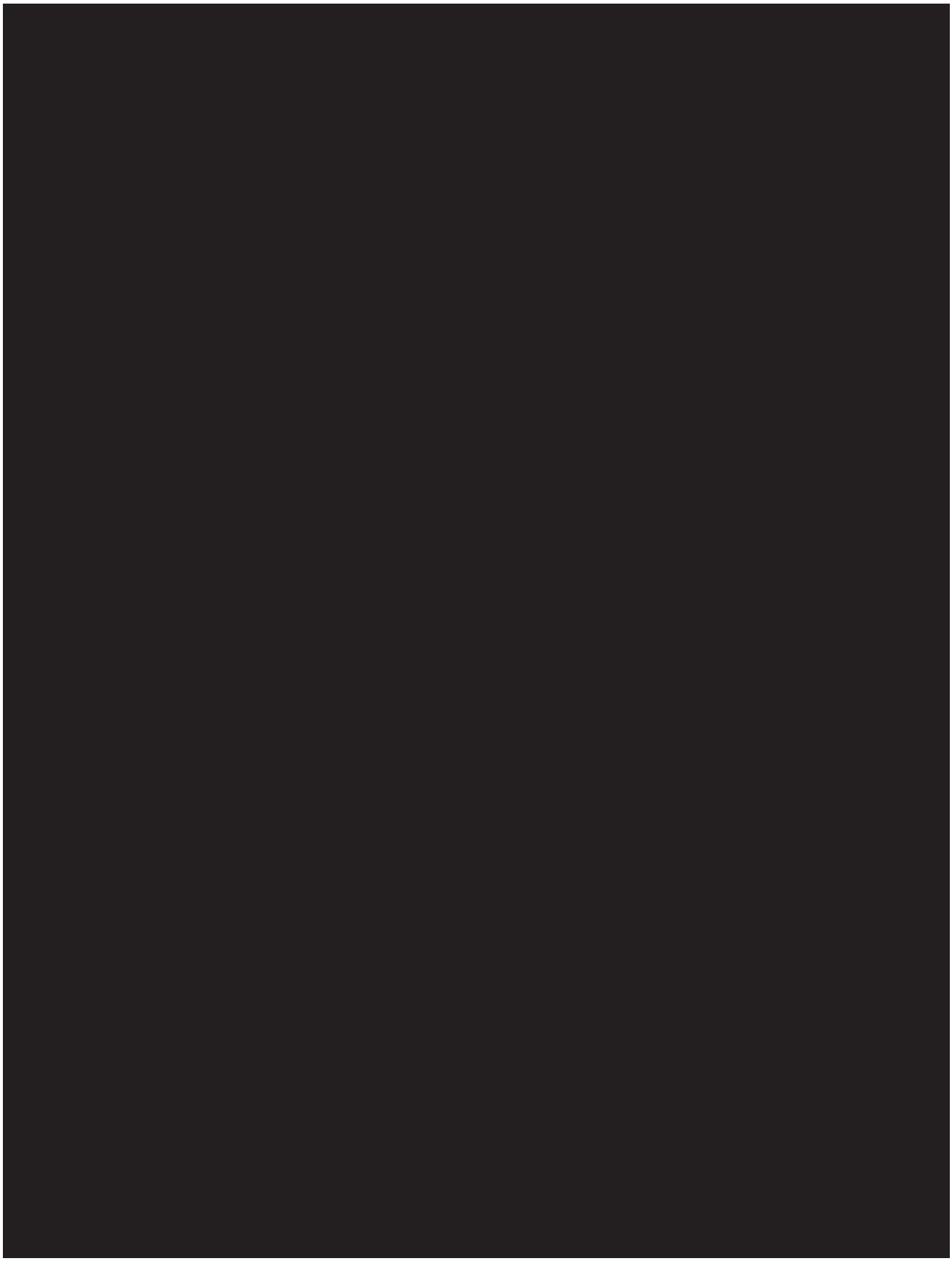
1.2 DRUG PROFILE

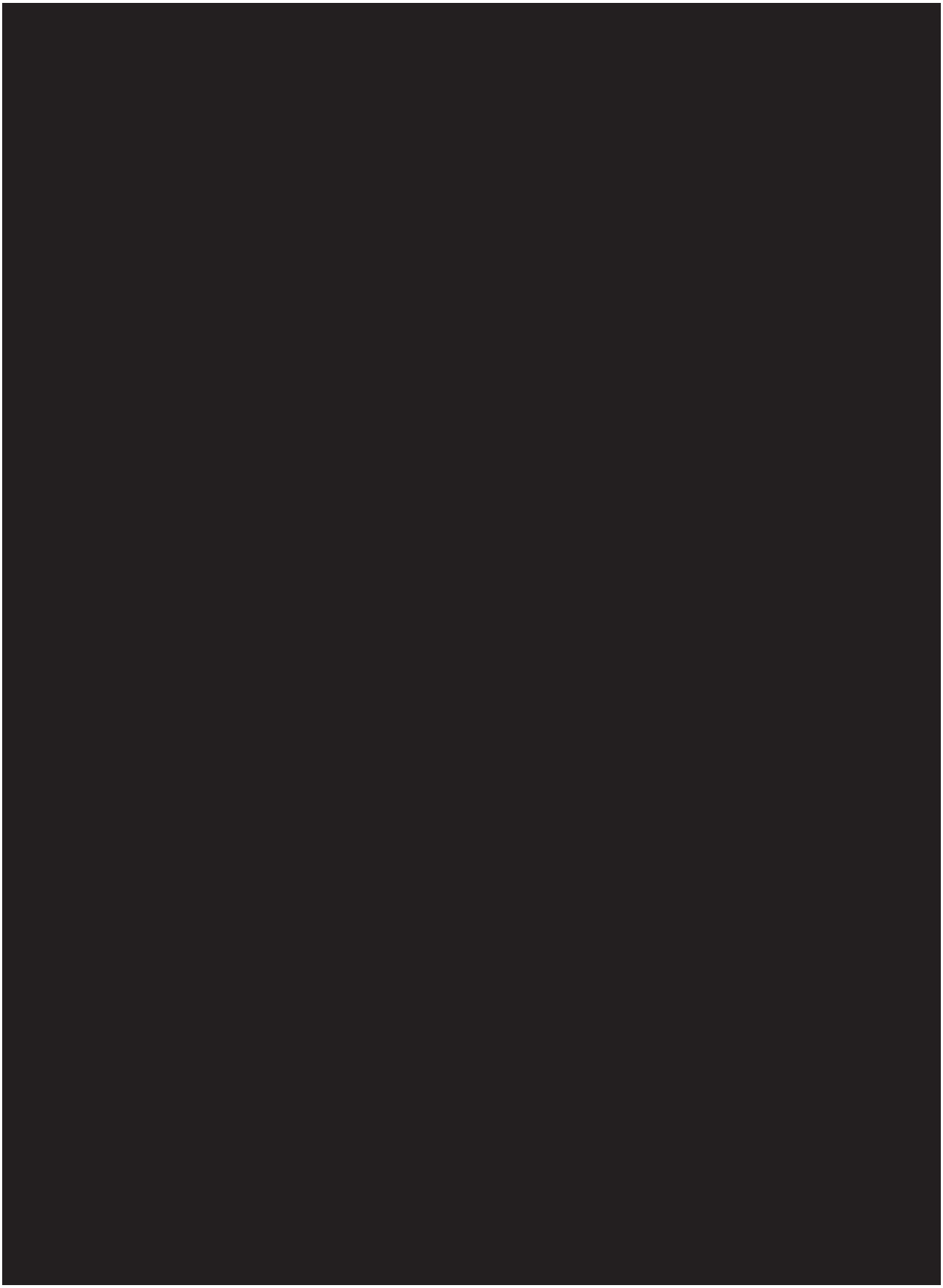
1.2.1 BI 1015550

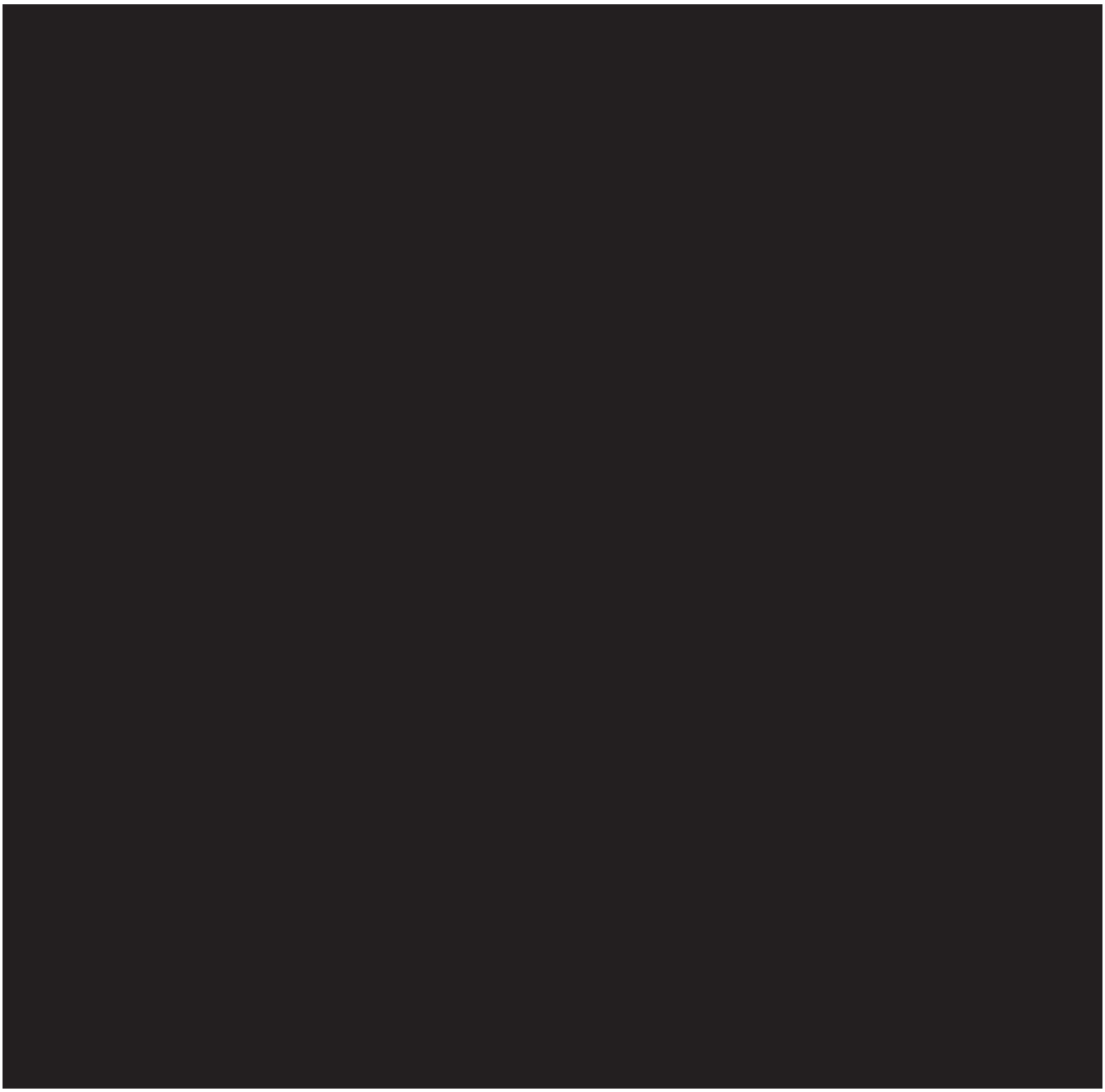
For a more detailed description of BI 1015550 profile, please refer to the current Investigator's Brochure (IB) [c02094779].

[redacted]

[redacted]







1.2.1.4 Clinical safety and efficacy

BI 1015550 has been investigated in a total of 9 clinical studies: 8 Phase I trials (seven trials in healthy subjects and one in patients with IPF), and a proof-of-clinical principle Phase II trial in patients with IPF. Overall, 146 healthy volunteers and 107 patients with IPF have been exposed to BI 1015550.

BI 1015550 was well tolerated following single dose administration up to 48 mg in healthy volunteers and following multiple administrations up to 18 mg bid over a treatment period of up to 12 weeks in patients.

Clinical safety

In healthy subjects, seven clinical studies in healthy subjects have been completed with BI 1015550. Overall, BI 1015550, up to a 48 mg single-dose and 12 mg bid multiple-dose appeared to show acceptable safety and tolerability. Headache, abdominal pain, nausea and diarrhoea, all of mild to moderate intensity, were the most commonly reported events. A trend toward weight loss in subjects treated with BI 1015550 was observed in study 1305-0011 [c22991937] in healthy volunteers.

In the MRD trial (1305-0002), one subject after multiple doses of 6 mg bid experienced postprandial pain, constipation, lower abdominal pain, lower left quadrant abdominal pain, and increased CRP in blood. These events were classified as drug-related. They were of mild intensity, with the exception of CRP increase which was of moderate intensity and led to discontinuation of the subject [c02191718].

No severe, serious, fatal AEs, nor SUSARS have been reported in the healthy volunteer studies. No dose-dependency was observed.

In patients with IPF, two clinical studies have been completed with BI 1015550: a Phase Ic MRD study in patients without background antifibrotic treatment (1305-0012 [c25085412]) and a proof-of-clinical principle Phase II study in patients stratified by background antifibrotic treatment (1305-0013 [c37065416]).

Overall, in Phase Ic and II trials in patients with IPF, BI 1015550 at a dose of 18 mg bid for up to 12 weeks showed acceptable safety and tolerability, both in patients without or with background antifibrotic treatment (nintedanib or pirfenidone). The most common AEs were GI events (more specifically diarrhoea), which were reported with a higher frequency under BI 1015550 treatment (vs. placebo) and in patients with background antifibrotic treatment.

In the Phase II trial which investigated treatment with BI 1015550 18 mg bid for 12 weeks in patients with IPF, diarrhoea was the most common AE leading to discontinuation of treatment and all AEs leading to discontinuation were reported in the BI 1015550 group. The frequency of SAEs in patients was numerically higher in placebo-treated patients, which was driven by placebo-treated patients without antifibrotic background treatment. Two patients with IPF treated with BI 1015550 had fatal AEs: one case of COVID-19 pneumonia and one case of suspected condition aggravated/suspected vasculitis; in both cases, risk factors were present. One AESI was reported (the fatal AE of suspected vasculitis), and evaluation by an external, independent Data Monitoring Committee could neither confirm the diagnosis of vasculitis, nor a causal relationship with BI 1015550. There were no AESIs of hepatic injury. No relevant patterns, clusters or imbalances were observed for any of the other safety topics of interest, including depression, anxiety, malignancies, insomnia, major adverse cardiac events, or tachyarrhythmia. No clinically relevant changes in vital signs (including body weight) or ECG parameters (including QTc) were observed. No changes in the C-SSRS and no AEs of suicidal ideation or behaviour were reported during trial treatment.

[redacted]

[redacted]

1.2.2 Midazolam

Midazolam is a short acting benzodiazepine which is used for the treatment of insomnia and as sedative premedication before surgical or diagnostic procedures. It has a volume of distribution of 0.7 to 1.2 L/kg at steady state. Its elimination half-life in young healthy volunteers ranges from 1.5 to 2.5 hrs. The plasma clearance was determined to be 300 to 500 mL/min. Midazolam is almost completely eliminated by biotransformation to 1-hydroxymidazolam and this process is mediated by CYP3A enzymes [R22-2466].

In contrast to testosterone or erythromycin, which have also been proposed as probe drugs to monitor CYP3A activity, midazolam is metabolised specifically by CYP3A and does not serve as a substrate for other CYP450 isoenzymes or the drug transporter P-glycoprotein. Intravenous midazolam is a sensitive in vivo probe of hepatic CYP3A activity, whereas orally administered midazolam is metabolised by both, intestinal and hepatic CYP3A.

The therapeutic dose of midazolam is 7.5 mg – 15 mg. In this trial, midazolam will be given as a single oral dose of 2 mg in both treatment periods. The PK of midazolam has been found to be dose proportional over a range of at least 0.001 µg to 3 mg [R17-3022]. The administration of an oral dose of 2 mg midazolam is without a major sedative effect [P10-00100].

For a more detailed description of the midazolam profile, please refer to the summary of product characteristics (SmPC) [R22-2466].

1.2.3 Residual Effect Period

The Residual Effect Period (REP) of BI 101550 [redacted]. This is the period after the last dose during which measurable drug levels and/or pharmacodynamic effects are still likely to be present.

The residual effect period of midazolam is 12 hours.

1.3 RATIONALE FOR PERFORMING THE TRIAL

[redacted]

[redacted]

In order to assess the potential impact of steady state BI 1015550 on CYP3A clinically, the effect of BI 1015550 at the current therapeutic dose of 18 mg bid on the midazolam pharmacokinetics will be evaluated in this DDI study. Midazolam is a recommended substrate of CYP3A4.

The data obtained in this DDI study will 1) inform the inclusion/exclusion criteria of patients with IPF and with progressive pulmonary fibrosis, as well as healthy subjects participating in future clinical studies with BI 1015550, 2) assess the need for further DDI studies and 3) provide further rationale for development of the drug label with regards to restriction of concomitant medication. [redacted]

Young, healthy male subjects will be recruited for this study. They (1) provide a relatively stable physiological, biochemical and hormonal basis for studying drug effects, (2) show no disease-related variation and (3) are not taking regular concomitant medications.

Based on the risk mitigation strategy, comprising of safety precautions and stopping rules, healthy subjects should not be exposed to undue risks by the intake of BI 1015550.

1.4 BENEFIT - RISK ASSESSMENT

1.4.1 Benefits

Participation in this clinical trial is without any (therapeutic) benefit for healthy subjects. Their participation, however, is of major importance for the development of BI 1015550.

1.4.2 Risks

Subjects are exposed to risks of trial procedures and risks related to the exposure to the trial medication. An overview of trial-related risks is given in Table 1.4.2: 1.

To date, no side effects have been identified for BI 1015550. Potential side effects of BI 1015550 will be under continuous evaluation during clinical development. Vasculitis and foetal loss are considered as important potential risk based only on non-clinical findings. The risks shown in the table below are hypothetical in nature; these are derived from general safety considerations of immunomodulatory drugs and from preclinical and clinical data of compounds with a comparable mode of action. For adverse events reported during clinical trials with BI 1015550 please refer to Section 1.2.1.

Table 1.4.2: 1 Overview of trial-related risks for this trial

Possible or known risks of clinical relevance	Summary of data, rationale for the risk	Mitigation strategy
Investigational Medicinal Product: BI 1015550		
[redacted]		

Table 1.4.2: 1 Overview of trial-related risks for this trial (cont.)

[redacted]

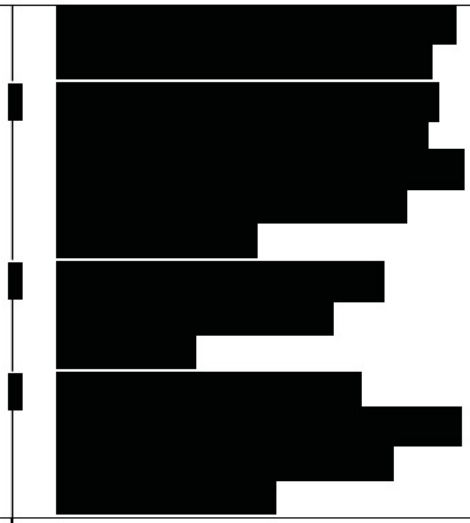
		
Weight decrease in underweight patients (BMI < 18.5 kg/m2)	• For the marketed PDE4i apremilast and roflumilast weight loss in underweight subjects is an identified important risk • Presumably caused by increased energy expenditure and causing predominately loss of body fat.	• Inclusion of subjects with BMI > 18.5 only is routine inclusion criterion in Phase I • Subjects who reach a BMI <18.5 kg/m2, and subsequently experience unexplained and clinically significant weight loss (>10%) will be discontinued from trial treatment • Weight will be monitored throughout the study, but a clinically relevant weight loss is not expected over a 2-weeks duration of dosing with BI 1015550.

Table 1.4.2: 1 Overview of trial-related risks for this trial (cont.)

Psychiatric disorders: Depression and anxiety Suicidality	• For the marketed PDE4i depression is listed as side effect and they are associated with increased risk of depression with some patients reporting suicidal ideation and attempts and also reported cases of completed suicide. • In IPF patients treated with 18 mg BI 1015550 bid up to 12 weeks, no on treatment events of suicidal ideation or behaviour and no events of depression or anxiety were reported.	• The risk after 2-weeks' administration of BI 1015550 (during the whole period of treatment subjects will stay under close medical surveillance in the Phase I unit) is considered low and will be addressed by careful close clinical monitoring for AEs and increased awareness by the investigator for signs and symptoms of depression and anxiety as well as for signs and symptoms of suicidal ideation and behaviour • Only healthy subjects with no relevant medical history including psychiatric disorders will be enrolled • Any suicidal behaviour in the past 2 years and any suicidal ideation of type 4 or 5 on the Columbia-Suicide Severity Ranking Score (CSSRS) in the past 3 months or at Visit 1 are exclusion criteria • Prospective monitoring for depression and anxiety will be performed using the HADS and the C-SSRS • Patient's withdrawal criteria in case of new-onset severe depression defined as HADS subscore >14 and/or suicidal behaviour or any suicidal ideation of type 4 or 5 in the C-SSRS.
[redacted]	[redacted]	[redacted]

Table 1.4.2: 1 Overview of trial-related risks for this trial (cont.)

Major Adverse Cardiovascular Events (MACE) and tachyarrhythmia	• Important potential risk for marketed PDE4 inhibitor apremilast. • In preclinical studies with BI 1015550 no adverse cardiovascular findings detected (focal myocardial degeneration or necrosis in monkeys were with no apparent vascular changes). • In clinical trials with BI 1015550 no relevant findings were observed.	• These risks will be addressed by careful safety monitoring and safety measures such as close clinical monitoring for AEs; regular monitoring of vital signs and ECG assessments • Subjects will stay under close medical surveillance during the whole period of treatment with BI 1015550
Malignancies	Inhibition of the immune response with an immunomodulatory drug may potentially impair immune defences and thus, theoretically decrease immune defence against malignancies.	• Subjects with a recent history of malignancy within 5 years will be excluded from participation in this trial • In case of occurrence of malignant neoplasm other than appropriately treated basal cell carcinoma or squamous cell carcinoma of the skin or in situ carcinoma of uterine cervix, the investigator should discontinue trial treatment • Diagnostics and treatment have to be initiated according to local standard of care.
Gastrointestinal disorders (e.g., diarrhoea, nausea, vomiting, abdominal pain)	• Vomiting and diarrhea are important dose-limiting side effects of marketed oral PDE-4 inhibitors. • In Phase II study of BI 1015550, diarrhoea was the most frequently reported AE.	• Increased awareness of symptoms • Careful monitoring of hydration in subjects with diarrhoea recommended • Symptomatic treatment if required.
Drug-induced liver injury (DILI)	Rare but severe event, thus under constant surveillance by sponsors and regulators.	• Timely detection, evaluation, and follow-up of laboratory alterations in selected liver laboratory parameters to ensure subjects´ safety • Increased awareness and expedited reporting (AESI).

Table 1.4.2: 1 Overview of trial-related risks for this trial (cont.)

Investigational Medicinal Product: Midazolam		
CNS-related effects	In line with its target indication the therapeutic use of midazolam will cause sedative effects	• The investigated dose of midazolam is 2 mg which is lower than the adult therapeutic dose (7.5 – 15 mg) • Subjects are under close monitoring at the site • Prior discharge the subject will be assessed by the investigator including its ability to drive and operate machines. If required the in-house period will be extended until the subject has completely recovered.
Trial procedures		
Bruising and, in rare cases, phlebitis, or nerve injury, potentially resulting in paraesthesia, reduced sensibility, and/or pain	General risk by venepuncture for blood sampling, acceptable in the framework of trial participation.	Medical expertise of the trial site

The total volume of blood withdrawn per subject during the entire trial will not exceed the volume of a normal blood donation (500 mL). No health-related risk to healthy subjects is expected from withdrawal of this volume of blood.

BI 1015550 is not recognized as high-risk compound, and patients with IPF exposed to BI 1015550 18 mg bid over up to 12 weeks demonstrated acceptable safety and tolerability. However, so far this dose level has not been tested in healthy volunteers, and safety data in healthy subjects is available up to 12 mg bid over 2 weeks only (also with acceptable safety and tolerability). Thus, the following general safety measures will be applied in order to minimize the risk to the healthy volunteers.

- 15 subjects will be divided in 3 cohorts (5 subjects per cohort). First BI 1015550 administrations in each cohort will be separated by at least 72 hours
- Stringent in- and exclusion criteria define a relatively homogenous population and exclude subjects that might be at increased risk for adverse events (see Section 3.3).
- Extensive safety laboratory examinations
- Treatment duration with BI 1015550 is limited to 2 weeks

- Hospitalisation during the whole duration of treatment with BI 1015550

Considerations on male contraception requirements:

The exposure through seminal fluid to sexual partners of males receiving BI 1015550 is expected to be minimal. At a plasma BI 1015550 C_{max} of 460 nM following an 18 mg bid dose, the worst-case seminal fluid level is anticipated to be 460 nM. Assuming a seminal fluid volume of 5 mL, a worst-case 100% absorption from the vagina, and a plasma volume of 3.5L, the resultant plasma concentration in the woman would be 0.66 nM. This concentration is approximately 3,500-fold below the most conservative maximum plasma level of 2,300 nM at the NOAEL in rats in a fertility and early embryonic development study [n00290709], and in EFD studies in rats and rabbits. This large safety margin, the absence of dysmorphogenesis in two species, and lack of genotoxicity suggest that barrier methods of contraception should not be required for a male administered BI 1015550 [c39775503].

Considerations on COVID-19:

Generally, in healthy volunteers' population, the risk of severe COVID-19 infection is not higher, and study participation would not increase the risk of becoming infected with SARS-CoV-2 beyond the potential risk associated with any need for the study participant to leave their home for study related activities. The appropriate risk minimisation measures will be taken in accordance with the public health precautions if needed due to the current status of the pandemic.

Based on the pharmacological mechanism and existing non-clinical and clinical data, there is no indication that treatment with BI 1015550 may increase the risk of infection including SARS-CoV-2 infection. Even though an increased risk of SARS-CoV-2 infection -or of a more severe COVID-19 disease in case of such an infection appears unlikely, subjects with active or recent (i.e. within the 4 weeks prior to screening) SARS CoV-2 infection should not be included in the trial which is also applicable for any other relevant acute infection (exclusion criterion No. 9).

In case of severe COVID-19 infection during the conduct of the trial, treatment with BI 1015550 has to be interrupted which is also applicable for any other relevant acute infection (criterion of withdrawal from trial treatment No. 9). The appropriate diagnostic and treatment measures will be taken in accordance with the public health precautions.

Of note, depending on the current status of the COVID-19 pandemic, all subjects with confirmed SARS CoV-2 infection will be handled in accordance with local guidance and SOPs meaning that any confirmed SARS CoV-2 infection during the conduct of the trial will lead to withdrawal of the subject from further trial treatment and/or trial procedures to avoid undue risks to other subjects at the trial site and the site personnel. The appropriate diagnostic and treatment measures will be taken in accordance with the public health precautions. If feasible, the EoS examination to be performed as early as possible after the SARS CoV-2 infection is resolved.

1.4.3 Discussion

1.4.3.1 Preclinical and clinical experience with BI 1015550

The nature of the target and the mechanism of action of BI 1015550 is well understood. BI 1015550 is [redacted].

[redacted]

Based on the published data, vasculopathy, characterised by inflammation, haemorrhage, and necrosis of blood vessels, is a known class effect of PDE4 inhibitors [R10-1559]. Currently, vasculopathy is thought to be a consequence of vascular tone dysregulation and subsequent inflammatory response [R17-0158]. Areas affected by vasculopathy are dependent on the non-clinical species tested. The GI tract/mesentery has been shown to be affected in multiple species (rats, minipigs, and monkeys) administered PDE4i, including marketed compounds apremilast and roflumilast [R17-0915, R17-0916, R17-0919]. Additional target organs/tissues of PDE4i include heart, liver, lung, thymus, and pancreas, and PDE4i effects have been noted in male and female reproductive tracts of non-clinical species such as the mouse, rat, hamster, dog and monkey. Vasculopathy is considered reversible, as demonstrated in a longitudinal study performed in mice with apremilast, which showed the recovery of PDE4i-related vasculopathy following repeated administration over 90 days [R17-0919]. Moreover, despite

the observed effects in non-clinical species, two PDE4 inhibitors (apremilast and roflumilast) have been successfully marketed and vascular injury has not been documented in humans.

Also, both marketed PDE4i (roflumilast, apremilast) have demonstrated adverse effects in reproductive toxicity studies that namely fertility and fetal loss and are labelled accordingly [R17-0915, R17-0919].

In healthy volunteers' studies, in which 146 subjects received BI 1015550, up to a 48 mg single-dose and 12 mg bid multiple-dose appeared to show acceptable safety and tolerability. So far, a dose of 18 mg bid has not been tested in healthy volunteers. However, *patients with IPF* demonstrated acceptable safety and tolerability at the dose of 18 mg bid (proposed therapeutic dose): 10 patients over up to 12 weeks in trial 1305-0012 [c25085412] and 97 patients over 12 weeks in trial 1305-0013 [c37065416].

1.4.3.2 Clinical experience with other PDE4 inhibitors

Non-selective PDE4 inhibitors have been approved for chronic obstructive pulmonary disease (COPD) with chronic bronchitis and a history of exacerbations (roflumilast), and for moderate to severe plaque psoriasis and active psoriatic arthritis (apremilast).

Roflumilast has been tested in Phase III studies for asthma and apremilast in Phase III studies for active Behcet's disease. No other PDE4 inhibitor has been tested in IPF.

Cilomilast

Cilomilast was the first PDE4 inhibitor developed for the maintenance of lung function (forced expiratory volume in one second (FEV1)) in patients with COPD but failed to demonstrate efficacy to support approval of the drug. Cilomilast non-clinical findings include mesenteric arteritis in rats. In the clinical program the frequency of GI AEs was high. Fecal occult blood testing was benign with unremarkable colonoscopy findings in the few patients with blood in the stool. Lack of approval was based on inadequate evidence of efficacy rather than any safety concern [P06-08316].

Roflumilast

Only one PDE4 inhibitor, roflumilast (Daxas® in EU, Daliresp® in US), has received marketing authorization by regulatory agencies for a respiratory indication, COPD.

More than 5,000 patients with COPD were included in the "COPD Safety Pool" of the large roflumilast clinical development program. The most frequently reported AEs associated with the treatment with roflumilast were diarrhoea, weight loss, nausea, abdominal pain and headache followed by insomnia, dizziness and decreased appetite.

The most common AEs leading to withdrawal in approximately 14% of the patients treated with roflumilast were nausea, diarrhoea and headache. The rate of withdrawal due to AEs among patients receiving placebo was 9%.

The mechanism of weight loss, which was observed in approximately 7% of the patients receiving roflumilast, is not fully understood [R10-1555].

Clinical manifestation of mesenteric vasculitis was not reported in these clinical studies. The SmPCs of Daxas®/Daliresp®, recommend the close monitoring of patient's body weight and its cautious use in patients with previous or existing psychiatric symptoms or if concomitant

treatment with other medicinal products, which are likely to cause psychiatric events, is intended. The above events were not observed with cilomilast, hence not clearly defined as class effects.

Apremilast

One PDE4 inhibitor for treatment of active psoriatic arthritis (Otezla®) has been approved by the FDA on March 2014, in September 2014 for moderate to severe plaque psoriasis and in July 2019 for the treatment of oral ulcers associated with Behçet's disease.

Otezla® has been evaluated in 1493 patients with active psoriatic arthritis in three randomised placebo-controlled studies [R17-1427].

The most common adverse reactions were diarrhoea, headache and nausea, followed by vomiting, upper respiratory tract infection, nasopharyngitis and abdominal pain.

The most common adverse reactions leading to discontinuation were diarrhoea (1.8%), nausea (1.8%) and headache (1.2%).

The proportion of patients with psoriatic arthritis who discontinued treatment due to any adverse reaction was 4.6% for patients taking Otezla® 30 mg twice daily and 1.2% for placebo-treated patients.

The product information of Otezla® recommends the close monitoring of patient's body weight and its cautious use in patients with history of depression and/or suicidal thoughts or behaviour [R14-1795].

BI 137882

One previous selective inhibitor of PDE4 B, BI 137882 has been tested in 40 healthy volunteers [U10-3777] at Boehringer Ingelheim. Most frequently reported drug-related AEs were oropharyngeal pain and headache. The oropharyngeal pain was considered to be related to the solution for reconstitution. Most AEs were mild in intensity. AEs of moderate intensity were reported in 5 patients; most frequent was headache. A fatal event, not considered related to study medication, occurred in a 25-year-old volunteer 8 days following administration of a single dose. The cause of death was myocarditis, in retrospect considered pre-existing with an additional finding of pre-existing Hashimoto thyroiditis [U11-2788].

1.4.3.3 Overall assessment

BI 1015550 is an oral preferential inhibitor of the PDE4B with broad anti-inflammatory and antifibrotic activities. Based on its mode of action, as well as available preclinical and clinical data, BI 1015550 is hypothesised to have complementary activity to current therapies in IPF and other forms of progressive pulmonary fibrosis.

In the current trial, adequate safety monitoring including vital signs, safety laboratory, suicidality assessment, depression & anxiety assessment and adverse events monitoring with a special focus on vasculitis assessment has been implemented. Taking into account these safety measures, potential risks to healthy participants are considered to be low and outweighed by the benefit of a successful clinical development of BI 1015550 in the context of the unmet medical need.

2. TRIAL OBJECTIVES AND ENDPOINTS

2.1 MAIN OBJECTIVES, PRIMARY AND SECONDARY ENDPOINTS

2.1.1 Main objectives

The main objective of this trial is to investigate the induction effect of multiple oral doses of 18 mg bid of BI 1015550 on the pharmacokinetics of the sensitive CYP3A4 substrate midazolam.

2.1.2 Primary endpoints

The following pharmacokinetic parameters will be determined for midazolam:

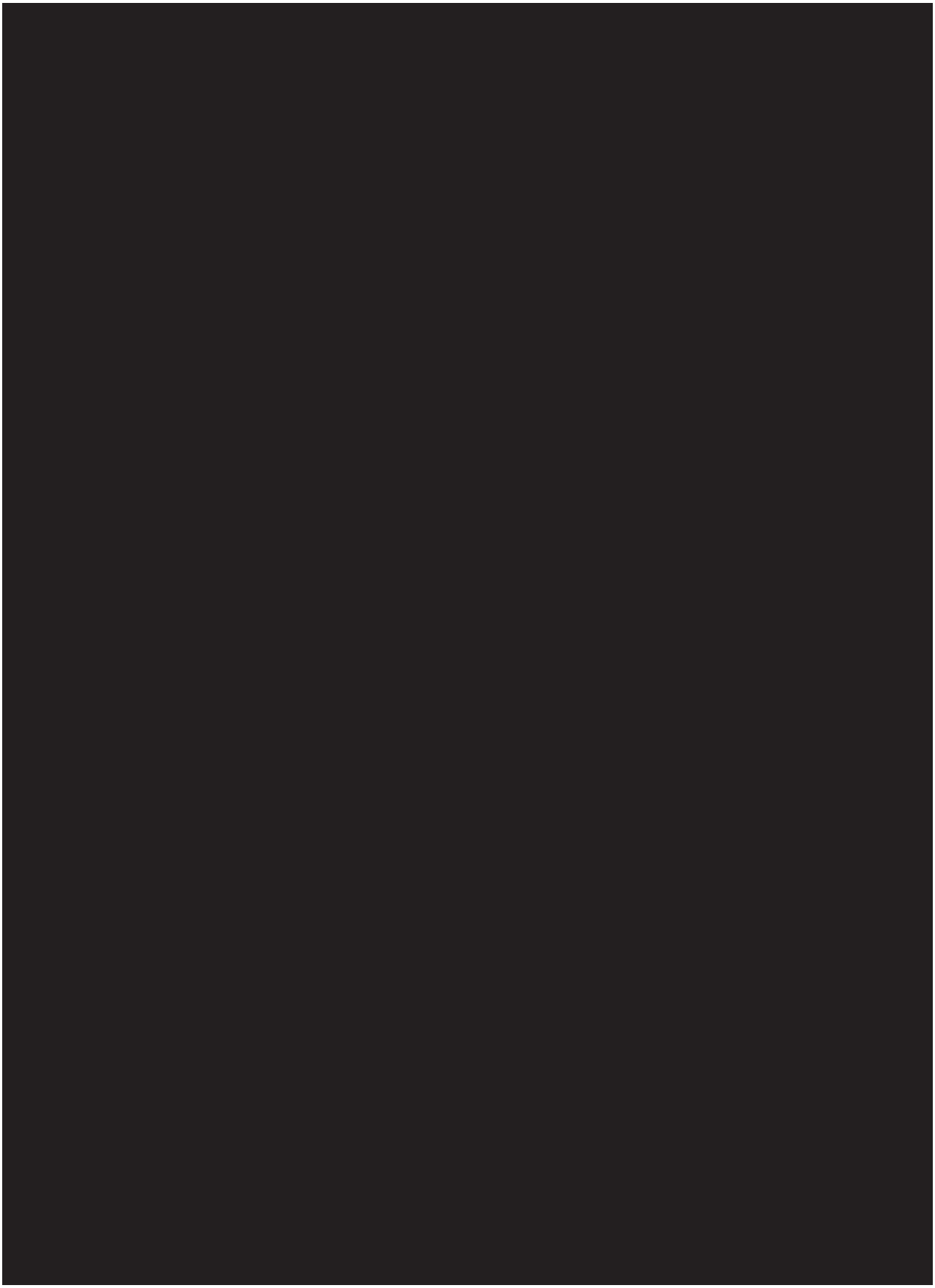
- AUC_{0-tz} (area under the concentration-time curve of the analyte in plasma over the time interval from 0 to the last quantifiable data point)
- C_{max} (maximum measured concentration of the analyte in plasma)

2.1.3 Secondary endpoint

The following pharmacokinetic parameter will be determined for midazolam:

- $AUC_{0-\infty}$ (area under the concentration-time curve of the analyte in plasma over the time interval from 0 extrapolated to infinity)

[redacted]



[redacted]

2.2.2.3 Safety and tolerability

Safety and tolerability of BI 1015550 will be assessed based on:

- Adverse events (including clinically relevant findings from the physical examination and vasculitis assessment)
- Suicidality assessment (C-SSRS), Hospitality anxiety and depression score (HADS)
- Safety laboratory tests
- 12-lead ECG
- Vital signs (blood pressure, pulse rate, body weight)

3. DESCRIPTION OF DESIGN AND TRIAL POPULATION

3.1 OVERALL TRIAL DESIGN

The trial will be performed as a non-randomised, open-label, two-period trial in healthy male subjects in order to compare the test treatment (T) to the reference treatment (R) using the fixed sequence R-T. An overview of both treatments is given below, for details refer to Section 4.1.

Reference Treatment (R):

- 2 mg midazolam given orally alone on Day 1 of Visit 2

Test Treatment (T)

- 18 mg BI 1015550 given orally bid (twice daily) over 13 days (Day -13 to Day -1 of Visit 3) and qd (once daily, morning dose) on Day 1 of Visit 3
- 2 mg midazolam given immediately after BI 1015550 on Day 1 of Visit 3

Treatments will be given under fasting conditions. [redacted]

An overview of all relevant trial activities is provided in the Flow Chart. For visit schedule and details of trial procedures at selected visits, refer to Sections 6.1 and 6.2, respectively.

3.2 DISCUSSION OF TRIAL DESIGN

For this one-sided DDI-trial (investigates the effect of the offender drug on the victim midazolam), the crossover design is preferred because of its efficiency: since each subject serves as his own control, the comparison between treatments is based on an intra-subject comparison, thus removing inter-subject variability from the comparison between treatments [R94 1529].

Because of the long (~ 27 hours) half-life of BI 1015550 (calculated for 6 and 12 mg doses) and because of the different treatment time schedules and in order to avoid overlapping induction effects, a fixed-sequence design is selected, in which the offender (BI 1015550) will be administered in the second study period only. The fixed-sequence design is not expected to lead to systematic errors in the estimation of the treatment effects since nonspecific time-effects are unlikely due to the short trial duration.

According to the FDA guideline on drug-drug interactions [P12-05791] it may take 2 weeks (or more) of daily drug administration to achieve the maximum level of induction in a specific pathway. BI 1015550 at 18 mg bid up to 12 weeks demonstrated acceptable safety and tolerability in IPF patients. However, this dose level has not been tested in healthy volunteers so far, the data is available up to 12 mg bid over 2 weeks and 48 mg single-dose (also with acceptable safety and tolerability). Considering the safety profile of BI 1015550 (Section 1.2.1) and other PDE4 inhibitors (Section 1.4.3.2), and the safety precautions measures (Section 1.4.2), a treatment duration was limited to 2 weeks in order not to expose study participants to undue risks. To confirm the achievement of a maximum CYP3A4

induction the biomarkers of induction (see Section 2.2.2.2) will be determined. For the victim drug midazolam, a single dose is sufficient.

The open-label treatment is not expected to bias results, since the trial endpoints are derived from measurement of plasma concentrations of the analyte.

3.3 SELECTION OF TRIAL POPULATION

It is planned that 15 healthy male subjects will enter the trial. They will be recruited from the volunteers' pool of the trial site.

A log of all subjects enrolled into the trial (i.e. who have signed informed consent) will be maintained in the ISF, irrespective of whether they have been treated with investigational drug or not.

3.3.1 Main diagnosis for trial entry

The trial will be performed in healthy subjects.

Please refer to Section 8.3.1 (Source Documents) for the documentation requirements pertaining to the in- and exclusion criteria.

3.3.2 Inclusion criteria

Subjects will only be included in the trial if they meet the following criteria:

1. Healthy male subjects according to the assessment of the investigator, as based on a complete medical history including a physical examination, vital signs (BP, PR), 12-lead ECG, and clinical laboratory tests without any clinically significant abnormalities
2. Age of 18 to 55 years (inclusive)
3. BMI of 18.5 to 29.9 kg/m^2 (inclusive)
4. Signed and dated written informed consent in accordance with ICH-GCP and local legislation prior to admission to the trial

3.3.3 Exclusion criteria

Subjects will not be allowed to participate, if any of the following general criteria apply:

1. Any finding in the medical examination (including BP, PR or ECG) deviating from normal and assessed as clinically relevant by the investigator
2. Repeated measurement of systolic blood pressure outside the range of 90 to 140 mmHg, diastolic blood pressure outside the range of 50 to 90 mmHg, or pulse rate outside the range of 50 to 90 bpm
3. Any laboratory value outside the reference range that the investigator considers to be of clinical relevance, in particular, hepatic parameters (ALT, AST, total bilirubin) or renal parameters (creatinine) exceeding the ULN or estimated GFR is below 90 ml/min/1.73m^2 after repeated measurements

4. Any evidence of a concomitant disease assessed as clinically relevant by the investigator
5. Gastrointestinal, hepatic, renal, respiratory, cardiovascular, metabolic, immunological or hormonal disorders
6. Cholecystectomy or other surgery of the gastrointestinal tract that could interfere with the pharmacokinetics of the trial medication (except appendectomy or simple hernia repair)
7. Diseases of the central nervous system (including but not limited to any kind of seizures or stroke), and other relevant neurological or psychiatric disorders
8. History of relevant orthostatic hypotension, fainting spells, or blackouts
9. Relevant chronic or acute infections, including but not limited to SARS-CoV 2, viral hepatitis and HIV
10. Any documented active or suspected malignancy or history of malignancy within 5 years prior to screening, except appropriately treated basal cell carcinoma of the skin, in situ squamous cell carcinoma of the skin
11. History of relevant allergy or hypersensitivity (including allergy to the trial medication or its excipients)
12. Use of drugs within 30 days of planned administration of trial medication that might reasonably influence the results of the trial (including drugs that cause QT/QTc interval prolongation)
13. Intake of an investigational drug in another clinical trial within 60 days of planned administration of investigational drug in the current trial, or concurrent participation in another clinical trial in which investigational drug is administered
14. Smoker (more than 10 cigarettes or 3 cigars or 3 pipes per day)
15. Inability to refrain from smoking on specified trial days
16. Alcohol abuse (consumption of more than 24 g per day)
17. Drug abuse or positive drug screening
18. Blood donation of more than 100 mL within 30 days of planned administration of trial medication or intended blood donation during the trial
19. Intention to perform excessive physical activities within one week prior to the administration of trial medication or during the trial
20. Inability to comply with the dietary regimen of the trial site
21. A marked prolongation of QT/QTc interval (such as QTc intervals that are repeatedly greater than 450 ms in males) or any other relevant ECG finding at screening
22. A history of additional risk factors for *Torsade de Pointes* (such as heart failure, hypokalaemia, or family history of Long QT Syndrome)

23. Subject is assessed as unsuitable for inclusion by the investigator, for instance, because the subject is not considered able to understand and comply with study requirements, or has a condition that would not allow safe participation in the study
24. During COVID-19 pandemic: laboratory test indicative of an ongoing SARS-CoV-2 infection
25. Concomitant intake of amprenavir, indinavir, nelfinavir, ritonavir, itraconazole or ketoconazole
26. According to C-SSRS questionnaire at screening: any suicidal ideation type 2-5 in the past 12 months or any lifetime history of suicidal behaviour
27. Acute or chronic severe depression defined as HADS subscore >14 at Visit 1 and/or Day -13 of Visit 3
28. History of vasculitis
29. Relevant immunodeficiency
30. Subjects with positive TB test at Visit 1 unless they have completed treatment for active or latent tuberculosis in line with local guidelines

For restrictions of the trial, refer to Section 4.2.2.

3.3.4 Withdrawal of subjects from treatment or assessments

Subjects may withdraw or may be removed from trial treatment or may withdraw consent to trial participation as a whole (‘withdrawal of consent’) with very different implications; please see Sections 3.3.4.1 and 3.3.4.2 below.

If a subject is removed from or withdraws from the trial prior to the first administration of trial medication, the data of this subject will not be entered in the case report form (CRF) and will not be reported in the clinical trial report (CTR).

If a subject is removed from or withdraws from the trial after the first administration of trial medication, this will be documented and the reason for discontinuation must be recorded in the CRF; in addition, trial data will be included in the CRF and will be reported in the CTR.

Following removal or withdrawal, a complete end-of-trial examination should be performed. If the discontinuation or withdrawal occurs before the end of the REP (see Section 1.2.3, the discontinued subject should, if possible, be questioned for AEs and concomitant therapies at or after the end of the REP, in order to ensure collection of AEs and concomitant therapies throughout the REP, if not contrary to any consent withdrawal of the subject.

3.3.4.1 Withdrawal from trial treatment

An individual subject will be withdrawn from trial treatment if:

1. The subject wants to withdraw from trial treatment. The subject will be asked to explain the reasons but has the right to refuse to answer

2. The subject has repeatedly shown to be non-compliant with important trial procedures and, in the opinion of both, the investigator and sponsor representative, the safety of the subject cannot be guaranteed as he / she is not willing or able to adhere to the trial requirements in the future.
3. The subject needs to take concomitant medication that interferes with the investigational medicinal product or other trial treatment
4. The subject can no longer receive trial treatment for medical reasons (such as surgery, adverse events (AEs), or diseases), in particular, if an AE of severe intensity or a serious adverse event (SAE) occurs
5. The subject has an elevation of AST and/or ALT ≥3-fold ULN
6. The subject has an elevation of AST and/or ALT ≥3-fold ULN and an elevation of total bilirubin ≥2-fold ULN (measured in the same blood sample) and/or needs to be followed up according to the DILI checklist provided in the ISF
7. Suicidal ideation (type 2-5) or any suicidal behaviour based on C-SSRS questionnaires during the trial
8. Subjects with a BMI<18,5 kg/m^2 that experience an additional, unexplained and clinically significant (>10%) weight loss during trial treatment
9. If any of the following adverse events is reported, the treatment has to be discontinued:
    - Severe or serious infections, opportunistic or mycobacterium tuberculosis infections
    - Malignancies
    - Vasculitis
    - A new onset of severe depression as defined by a HADS subscore >14.

Of note, depending on the current status of the COVID-19 pandemic, all subjects with confirmed SARS CoV-2 infection will be handled in accordance with local guidance and SOPs meaning that any confirmed SARS CoV-2 infection during the conduct of the trial will lead to discontinuation of the subject (refer to Section 1.4.2).

In addition to these criteria, the investigator may discontinue subjects at any time based on his or her clinical judgment.

If new efficacy or safety information becomes available, Boehringer Ingelheim will review the benefit-risk-assessment and, if needed, pause or discontinue the trial treatment for all subjects or take any other appropriate action to guarantee the safety of the trial subjects.

3.3.4.2 Withdrawal of consent to trial participation

Subjects may withdraw their consent to trial participation at any time without the need to justify the decision. If a subject wants to withdraw consent, the investigator should be involved in the discussion with the subject and explain the difference between trial treatment discontinuation and withdrawal of consent to trial participation, as well as explain the options for continued follow-up after trial treatment discontinuation, please see Section 3.3.4.1 above.

3.3.4.3 Discontinuation of the trial by the sponsor

Boehringer Ingelheim reserves the right to discontinue the trial at any time for any of the following reasons (if reasons 4 and/or 5 are met, the trial should be discontinued immediately):

1. Failure to meet expected enrolment goals overall or at a particular trial site
2. The sponsor decides to discontinue the further development of the investigational products
3. Deviation from GCP, or the CTP, or the contract with BI impairing the appropriate conduct of the trial
4. New toxicological findings, serious adverse events, or any safety information invalidating the earlier positive benefit-risk-assessment (see Section 3.3.4.1)
5. More than 50% of the subjects show drug-related and clinically relevant adverse events of moderate or severe intensity, or if at least one drug-related serious adverse event or one severe non-serious adverse drug reaction is reported. If a relationship between AE and drug is at least reasonably possible (i.e. the relationship cannot be ruled out), it is to be considered as drug-related (see Section 5.2.6.1.6).

The investigator / trial site will be reimbursed for reasonable expenses incurred in case of trial termination (except if item 3 applies).

3.3.5 Replacement of subjects

In case more than 3 subjects do not complete the trial (including subjects non- evaluable for PK), subjects may be replaced if considered necessary to reach the objective of the trial. Subjects who withdraw or are withdrawn from treatment or assessments because of a drug-related adverse event will not be replaced. The Clinical Trial Leader together with the Trial Pharmacokineticist and the Trial Statistician are to decide, if and how many subjects will be replaced. The total number of replacements may not exceed 1/3 of the total number of evaluable subjects anticipated to complete the trial. A replacement subject will be assigned a unique trial subject number and will receive both treatments per trial protocol.

4. TREATMENTS

4.1 INVESTIGATIONAL TREATMENTS

4.1.1 Identity of the Investigational Medicinal Products

The characteristics of the test product are given below:

Substance:	BI 1015550
Pharmaceutical formulation:	Film-coated tablets
Source:	BI Pharma GmbH & Co. KG, Germany
Unit strength:	18 mg
Posology:	1 – 0 – 1
Mode of administration:	Oral
Duration of use:	13 days bid (twice daily on Days -13 to -1 of Period 2) and 1 day qd (once daily, only morning dose on Day 1 of Period 2)

The characteristics of the reference product are given below:

Name:	Midazolam-[redacted]2 mg/ml Lösung
Substance:	Midazolam
Pharmaceutical formulation:	Oral solution
Source:	[redacted]
Unit strength:	2 mg/mL
Posology:	1 mL – 0 – 0
Mode of administration:	Oral
Duration of use:	Single dose on Day 1 of Period 1 and Period 2

4.1.2 Selection of doses in the trial and dose modifications

BI 1015550:

18 mg bid of BI 1015550 is the therapeutic dose that is used in clinical drug development.

Midazolam:

The clinically recommended dose for adults is 7.5 mg to 15 mg. For safety reasons a dose of 2 mg has been selected for this trial. Considering the pre-clinical data, an increase of exposure is not expected with combined drug intake.

4.1.3 Method of assigning subjects to treatment groups

Prior to the start of the study, subjects willing to participate will be recruited to cohorts according to their temporal availability. There is only one treatment sequence investigated in this trial, and each subject will be allocated to the treatment sequence R-T. The subjects will be allocated to a trial subject number on a first-come, first-served basis prior to first administration of trial medication (midazolam) in the morning of Day 1 of Visit 2.

Once a subject number has been assigned, it cannot be reassigned to any other subject.

For safety reasons (see Section 1.4.2), 15 subjects will be divided in 3 cohorts (5 subjects per cohort). First BI 1015550 administrations in each cohort will be separated by at least 72 hours which is expected to cover the period of highest risk / peak effect. Within each cohort subjects can be dosed as close as 5 min apart.

4.1.4 Drug assignment and administration of doses for each subject

This trial is a non-randomised trial with 2 periods. All subjects will receive the 2 treatments in a fixed order. The treatments to be evaluated are summarised in Table 4.1.4: 1 below.

Table 4.1.4: 1 Dosage and treatment schedule

Treatment	Substance	Formulation	Unit strength	Dosage	Total daily dose
R (Reference)	Midazolam	Oral solution	2 mg/mL	1 mL (D1 V2)	2 mg
T (Test)	BI 1015550	Tablet	18 mg	1 tablet bid for 13 days (D-13 to D-1 V3) and	36 mg
				1 tablet qd (D1 V3)	18 mg
	Midazolam	Oral solution	2 mg/mL	1 mL (D1 V3)	2 mg

Administration of midazolam in both treatment periods and BI 1015550 (morning doses) will be performed after subjects have fasted overnight; fasting is to start no later than 10 h before the scheduled dosing. The evening dose of BI 1015550 will be administered approximately 12 h after the morning dose on Days -13 to -1 in Period 2, no special fasting requirement applies. No evening dose of BI 1015550 will be given on Day 1 of Period 2.

The investigator (or authorised designee) will administer the trial medication as an oral dose together with about 240 mL of water to subjects who are in a standing position. For drug administration, the so-called four-eye principle (two-person rule) should be applied. For this, one authorised employee of the trial site should witness the administration of trial medication, and – if applicable – its preparation (e.g. reconstitution), if correct dosage cannot be ensured otherwise. On Day 1 of Period 2 both midazolam and BI 1015550 will be administered together (midazolam to be given first).

Subjects will be kept under close medical surveillance until 12 h after midazolam administration in Period 1 and starting from the first BI 1015550 administration until 24 h after the last dose administration in Period 2.

On Day -13 and Day 1 of Period 1 and Day 1 of Period 2, during the first 4 h after drug administration, subjects are not allowed to lie down (i.e. no declination of the upper body of more than 45 degrees from upright posture). For restrictions with regard to diet, see Section 4.2.2.2.

[redacted]

4.1.5 Blinding and procedures for unblinding

This non-randomised open-label Phase I trial will be handled in an open fashion throughout. The treatment assignment will be available to all involved parties.

4.1.6 Packaging, labelling, and re-supply

BI 1015550 tablets will be provided by BI. They will be packaged and labelled in accordance with the principles of Good Manufacturing Practice (GMP). For details of packing and the description of the label, refer to the ISF.

Midazolam will be obtained by the clinical trial site from a public pharmacy. The drug will be dispensed out of the original, unmodified packages.

The EudraCT number is indicated on the title page of this protocol as well as on the subject information and informed consent forms. No re-supply is planned.

4.1.7 Storage conditions

Drug supplies will be kept in their original packaging and in a secure limited access storage area in accordance with the recommended (labelled) storage conditions. If necessary, a temperature log must be maintained to make certain that the drug supplies are stored at the correct temperature. If the storage conditions are found to be outside the specified range, the Clinical Research Associate (as provided in the list of contacts) is to be contacted immediately.

4.1.8 Drug accountability

The investigator or designee will receive the investigational drugs delivered from the sponsor when the following requirements are fulfilled:

- Approval of the clinical trial protocol by the IRB / ethics committee
- Availability of a signed and dated clinical trial contract between the sponsor or delegate and the investigational site
- Approval/notification of the regulatory authority, e.g. competent authority
- Availability of the *curriculum vitae* of the Principal Investigator
- Availability of a signed and dated clinical trial protocol

Only authorised personnel documented in the form 'Trial Staff List' may dispense investigational drugs to trial subjects. Investigational drugs are not allowed to be used outside of this protocol.

The investigator or designee must maintain records of the product's delivery to the trial site, the inventory at the site, the use by each subject, and the disposal of unused products. These records will include dates, quantities, batch / serial numbers, expiry ('use-by') dates, and the unique code numbers assigned to the investigational medicinal product and trial subjects. The investigator or designee will maintain records that document adequately that the subjects were provided the doses specified by the CTP and reconcile all investigational medicinal products received from the sponsor.

At the time of disposal of remaining trial medication, the investigator or designee must verify that no remaining supplies are in the investigator's possession.

All unused medication will be disposed of locally by the trial site upon written authorisation of the Clinical Trial Leader. Receipt, usage and disposal of trial medication must be documented on the appropriate forms. Account must be given for any discrepancies.

4.2 OTHER TREATMENTS, EMERGENCY PROCEDURES, RESTRICTIONS

4.2.1 Other treatments and emergency procedures

There are no special emergency procedures to be followed. No additional treatment is planned. However, if adverse events require treatment, the investigator can authorise symptomatic therapy. In those cases, subjects will be treated as necessary and, if required, kept under supervision at the trial site or transferred to a hospital until all results of medical evaluations are acceptable.

Vasculitis

In case of events suspicious for vasculitis, trial treatment will be discontinued. A thorough work-up has to be initiated including at least but not limited to

- appropriate imaging, including angiography
- biopsy if possible
- appropriate laboratory screening, including measurements of vasculitis markers at the local lab, see Section 5.2.3. In addition, an analysis of the previously collected and stored samples will need to be requested and considered.
- thorough documentation of all reported symptoms

Referral to a vasculitis expert is recommended. If required, vasculitis treatment should be initiated according to standard of care.

4.2.2 Restrictions

4.2.2.1 Restrictions regarding concomitant treatment

In principle, no concomitant therapy is allowed. All concomitant or rescue therapies will be recorded (including time of intake on trial days) on the appropriate pages of the CRF.

For treatment of headache, one of the most frequent AEs in clinical studies with BI 1015550 (see Section 1.2.1.4), if necessary, short-term use of ibuprofen or paracetamol is acceptable. Another common AE, diarrhoea, can be treated symptomatically with loperamide.

4.2.2.2 Restrictions on diet and life style

While admitted to the trial site, the subjects will be instructed not to consume any foods or drinks other than those provided by the staff.

On Day 1 of both treatment periods and Day -13 of Treatment Period 1, standardised meals will be served at the times indicated in the Flow Chart. No food is allowed for at least 4 h after drug intake. Starting from 1 h before drug intake until lunch, fluid intake is restricted to 240 mL of water administered with the drug, and an additional 240 mL of water at 2 h and 4 h post-dose (mandatory for all subjects). From lunch until 12 h post-dose, total fluid intake is restricted to 2000 mL. On the other days during in-house confinement, meals could be served after drug administration (if applicable) and no restriction with regards to fluid intake applies.

Alcoholic beverages, grapefruits, Seville oranges (sour or bitter oranges) and their juices, and dietary supplements and products containing St. John's wort (*Hypericum perforatum*) are not permitted from 7 days before the first administration of trial medication until after the last PK sample of each trial period is collected.

Methylxanthine-containing drinks or foods (such as coffee, tea, cola, energy drinks, or chocolate) are not allowed during in-house confinement at the trial site on Day 1 of Period 1 and Days -13 and 1 of Period 2.

Smoking is not allowed during in-house confinement.

Excessive physical activity (such as competitive sport) should be avoided from 7 days before the first administration of trial medication until the end of trial examination.

Direct exposure to the sun or to solarium radiation should be avoided during the entire trial.

4.3 TREATMENT COMPLIANCE

Compliance will be assured by administration of all trial medication in the trial centre under supervision of the investigating physician or a designee. The measured plasma concentrations of trial medication will provide additional confirmation of compliance.

Subjects who are non-compliant (for instance, who do not appear for scheduled visits or violate trial restrictions) may be removed from the trial and the CRF will be completed accordingly (for further procedures, please see Section 3.3.4.1).

5. ASSESSMENTS

5.1 ASSESSMENT OF EFFICACY

Not applicable.

5.2 ASSESSMENT OF SAFETY

5.2.1 Physical examination

At screening, the medical examination will include demographics, height and body weight, smoking and alcohol history (alcohol history not mandatory to be entered into CRF or to be reported), relevant medical history and concomitant therapy, review of inclusion and exclusion criteria, review of vital signs (BP, PR), 12-lead ECG, laboratory tests, a physical examination, assessment of suicidal ideation and behaviour using the C-SSRS ('baseline/screening scale'), and assessment of anxiety and depression using the HADS.

At the end of trial examination, it will include review of vital signs, 12-lead ECG, laboratory tests, physical examination including determination of body weight, and assessment of suicidal ideation, behaviour using C-SSRS ('since last visit scale'), and assessment of anxiety and depression using the HADS.

5.2.2 Vital signs

Systolic and diastolic blood pressures (BP) as well as pulse rate (PR) or heart rate (heart rate is considered to be equal to pulse rate) or pulse rate will be measured by a blood pressure monitor (Dinamap Pro 100, [redacted]) at the times indicated in the Flow Chart, after subjects have rested for at least 5 min in a supine position. All recordings should be made using the same type of blood pressure recording instrument on the same arm, if possible. Measurement of body weight will be performed as well at the times indicated in the Flow Chart. Further, body temperature will be monitored as part of vital signs assessment if still needed due to the current status of the pandemic.

5.2.3 Safety laboratory parameters

For the assessment of laboratory parameters, blood and urine samples will be collected by the trial site at the times indicated in the Flow Chart after the subjects have fasted for at least 10 h. For retests, at the discretion of the investigator or designee, overnight fasting is not required.

The parameters to be assessed are listed in Tables 5.2.3: 1 and 5.2.3: 2. Reference ranges will be provided in the ISF.

Manual differential white blood cell count or urine sediment examinations will only be performed if there is an abnormality in the automatic blood cell count or in the urinalysis, respectively.

Table 5.2.3: 1 Routine laboratory tests

Functional lab group	BI test name [comment/abbreviation]	A	B	C
Haematology	Haematocrit	X	X	X
	Haemoglobin	X	X	X
	Red Blood Cell Count/Erythrocytes	X	X	X
	Reticulocytes, absol.	X	X	X
	Reticulocytes/Erythrocyte	X	X	X
	White Blood Cells/Leucocytes	X	X	X
	Platelet Count/Thrombocytes (quant)	X	X	X
Automatic WBC differential, relative	Neutrophils/Leukocytes; Eosinophils/Leukocytes; Basophils/ Leukocytes; Monocytes/Leukocytes; Lymphocytes/Leukocytes	X	X	X
Automatic WBC differential, absolute	Neutrophil, absol.; Eosinophils, absol.; Basophils, absol.; Monocytes, absol.; Lymphocytes, absol.	X	X	X
Manual differential WBC (if automatic differential WBC is abnormal)	Neut. Poly (segs)/Leukocytes; Neut. Poly (segs), absol.; Neutrophils Bands/Leukocytes; Neutrophils Bands, absol.; Eosinophils/Leukocytes; Eosinophils, absol.; Basophils/ Leukocytes; Basophils, absol.; Monocytes/Leukocytes; Monocytes, absol.; Lymphocytes/Leukocytes; Lymphocytes, absol.			
Coagulation	Activated Partial Thromboplastin Time	X	X	X
	Prothrombin time - Quick	X	X	X
	Prothrombin time – INR (International Normalization Ratio)	X	X	X
	Fibrinogen	X	X	X
Enzymes	AST [Aspartate aminotransferase] /GOT, SGOT	X	X	X
	ALT [Alanine aminotransferase] /GPT, SGPT	X	X	X
	Alkaline Phosphatase	X	X	X
	Gamma-Glutamyl Transferase	X	X	X
	Creatine Kinase [CK]	X	X	X
	Creatine Kinase Isoenzyme MB [only if CK is elevated]	X	X	X
	Lactic Dehydrogenase	X	X	X
	Lipase	X	X	X
	Amylase	X	X	X
Hormones	Thyroid Stimulating Hormone	X	--	--
	Free T3 - Triiodothyronine	X	--	--
	Free T4 – Thyroxine	X	--	--
Substrates	Glucose (Plasma)	X	X	X
	Creatinine	X	X	X
	GFR/ CKD-EPI	X	X	X
	Bilirubin, Total	X	X	X
	Bilirubin, Direct	X	X	X
	Protein, Total	X	X	X
	Albumin	X	X	X
	Albumin (Protein Electrophoresis)	X	--	--
	Alpha-1-Globulin (Protein Electrophoresis)	X	--	--
	Alpha-2-Globulin (Protein Electrophoresis)	X	--	--
	Beta-Globulin (Protein Electrophoresis)	X	--	--
	Gamma-Globulin (Protein Electrophoresis)	X	--	--
	C-Reactive Protein (Quant)	X	X	X
	Uric Acid	X	X	X
	Cholesterol, total	X	X	X
	Triglyceride	X	X	X

Table 5.2.3: 1 Routine laboratory tests (cont.)

Functional lab group	BI test name [comment/abbreviation]	A	B	C
Electrolytes	Sodium	X	X	X
	Potassium	X	X	X
	Calcium	X	X	X
Urinalysis (Stix)	Urine Nitrite (qual)	X	X	X
	Urine Protein (qual)	X	X	X
	Urine Glucose (qual)	X	X	X
	Urine Ketone (qual)	X	X	X
	Urobilinogen (qual)	X	X	X
	Urine Bilirubin (qual)	X	X	X
	Urine RBC/Erythrocytes (qual)	X	X	X
	Urine WBC/Leucocytes (qual)	X	X	X
	Urine pH	X	X	X
Urine sediment (microscopic examination if erythrocytes, leukocytes nitrite or protein are abnormal in urine)	Only positive findings will be reported (for instance, the presence of sediment bacteria, casts in sediment, squamous epithelial cells, erythrocytes, leukocytes)			

A: parameters to be determined at Visit 1 (screening examination)
B: parameters to be determined at Visit 3 on Days -13, -10, -6 and 1 (for time points refer to Flow Chart)
C: parameters to be determined at Visit 4 (end of trial examination)

The tests listed in Table 5.2.3: 2 are exclusionary laboratory tests that may be repeated as required. The results will not be entered in the CRF/database and will not be reported in the CTR. Except for drug screening and COVID-19, it is planned to perform these tests during screening only. Drug screening will be performed at screening and prior to each treatment period.

Table 5.2.3: 2 Exclusionary laboratory tests

Functional lab group	Test name
Drug screening (urine)	Amphetamine/MDA Barbiturates Benzodiazepine Cannabis Cocaine Methadone Methamphetamines/MDMA/Ecstasy Opiates Phencyclidine Tricyclic antidepressants
Infectious serology (blood)	Hepatitis B surface antigen (qualitative) Hepatitis B core antibody (qualitative) Hepatitis C antibodies (qualitative) HIV-1 and HIV-2 antibody (qualitative) Hepatitis B DNA PCR (quantitative)[2] QuantiFERON®-TB Gold Test (IGRA)[3]
COVID-19 (nasopharyngeal swab)[1]	SARS CoV-2 PCR test

[1] if needed due to the current status of the pandemic, evaluation will be performed at screening and shortly (within 72 hours) before admission to trial site as per Flow Chart.

[2] to be conducted if Hepatitis B core antibody is positive and Hepatitis B surface antigen is negative.

[3] if the first QuantiFERON®-TB Gold Test result is undetermined, a retest should be performed. If the retest is undetermined as well, a tuberculin skin test (PPD or Mantoux) should be performed.

Immunological vasculitis markers

In case of a suspected vasculitis an additional blood sample will be taken. It will be stored and analysed for the following immunological vasculitis markers:

- MPO-ANCA
- PR3-ANCA
- circulating cryoglobulins
- IL-6
- anti-glomerular basement membrane (GBM) antibodies
- anti-C1q antibodies (immune complex-associated small-vessel vasculitis)
- rheumatoid factor
- antinuclear antibodies
- complement C3, C4, CH 50, anti-C1q antibodies.

To encourage compliance with alcoholic restrictions, a breath alcohol test (e.g. Alcotest® 6820 med., [redacted]) will be performed prior to each treatment period, and may be repeated at any time during the trial at the discretion of an investigator or designee. The results will not be included in the CTR.

The laboratory tests listed in Tables 5.2.3: 1 and 5.2.3: 2 will be performed at [redacted], with the exception of drug screening tests. These tests will be performed at the trial site using

SureStep ML 10 Scr Test Device; [redacted], or comparable test systems.

Laboratory data will be transmitted electronically from the laboratory to the trial site.

It is the responsibility of the Investigator to evaluate the laboratory reports. Clinically relevant abnormal findings as judged by the Investigator are to be reported as adverse events (please refer to Section 5.2.6).

In case the criteria for hepatic injury are fulfilled, a number of additional measures will be performed (please see Section 5.2.6.1.4).

5.2.4 Electrocardiogram

Twelve-lead ECGs (I, II, III, aVR, aVL, aVF, V1 - V6) will be recorded using a computerised electrocardiograph (CardioSoft EKG System, [redacted] at the times provided in the Flow Chart.

To achieve a stable heart rate at rest and to assure high quality recordings, the site personnel will be instructed to assure a relaxed and quiet environment, so that all subjects are at complete rest.

All ECGs will be recorded for a 10 sec duration after subjects have rested for at least 5 min in a supine position. ECG assessment will always precede all other trial procedures scheduled for the same time to avoid compromising ECG quality.

All ECGs will be stored electronically on the Muse CV Cardiology System ([redacted]). Electrode placement will be performed according to the method of Wilson, Goldberger and Einthoven modified by Mason and Likar (hips and shoulders instead of ankles and wrists).

All locally printed ECGs will be evaluated by the investigator or a designee. Abnormal findings will be reported as AEs (during the trial) or baseline conditions (if identified at the screening visit) if assessed to be clinically relevant by the investigator. Any ECG abnormalities will be carefully monitored and, if necessary, the subject will be removed from the trial and will receive the appropriate medical treatment.

ECGs may be repeated for quality reasons (for instance, due to alternating current artefacts, muscle movements, or electrode dislocation) and the repeated ECG will be used for analysis. Additional (unscheduled) ECGs may be collected by the investigator for safety reasons.

5.2.5 Other safety parameters

5.2.5.1 Suicidality assessment

Based on the FDA guidance on prospective assessment of suicidality [R12-4395] suicidal ideation and behaviour (SIB) will be proactively evaluated as part of the drug development. This also refers to clinical trials in healthy volunteers with multiple dose administration of the IMP.

The C-SSRS is a semi-structured, investigator-rated interview, developed by clinical experts in cooperation with the FDA, assessing both suicidal behaviour and suicidal ideation. It does

not give a global score, but provides some categorical and some severity information specifically for behaviour and ideation [R08-1147].

The C-SSRS interview may be administered by any type of physician, psychologist, clinical social worker, mental health counsellor, nurse, or coordinator with C-SSRS training. It has a typical duration of five minutes, and causes only a low burden on subjects. At a minimum, the interview consists of 2 screening questions related to suicidal ideation and 4 related to suicidal behaviour, and may be expanded to up to 17 items in case of positive responses. Free text entries are allowed.

The C-SSRS has been widely used in large multinational clinical trials. The C-SSRS will be administered at the screening visit (using the 'screening / baseline' version) with the aim to exclude subjects with active moderate or severe symptomatology within a specified time prior to the screening or baseline visit. The life time history of suicidal ideation and behaviour will also be recorded. See Section 10.1 for the original English C-SSRS. For this trial, the paper version of the respective German translation will be used.
After the screening visit, the 'since last visit' version is used for the suicidality assessment at the time points indicated in the Flow Chart.

The investigator is to review all reports for plausibility and clinical relevance. Doubtful reports may be repeated or reports may be validated by a consulting psychiatrist. If there is a confirmed report of suicidal behavior or suicidal ideation type 4 or 5 after start of trial, the investigator is to immediately interview the subject during the clinic visit, and/or is to consult a psychiatrist. If the report is confirmed, appropriate actions for the subject's safety have to be initiated.

There are following types of suicidal ideation and behaviour [R12-4395]:

Suicidal ideation

1. Passive
2. Active: nonspecific – no method, intent or plan
3. Active: method, but no intent or plan
4. Active: method and intent, but no plan
5. Active: method, intent, and plan

Suicidal behaviour

1. Completed suicide
2. Suicide attempt
3. Interrupted attempt
4. Aborted attempt
5. Preparatory actions toward imminent suicidal behaviours.

For details regarding AE reporting see Section 5.2.6.2.3

5.2.5.2 Depression and anxiety

Prospective monitoring using the Hospital Anxiety and Depression Scale (HADS).

This questionnaire is patient friendly and easy to use and takes less than 5 minutes for completion. The questionnaire comprises seven questions for anxiety and seven questions for depression that are scored separately. Cut-off scores are available for quantification: The HADS questionnaire has been validated in many languages, countries and settings including general practice and community settings and is one of the tools recommended by National Institute for Health and Care Excellence (NICE) for diagnosis of depression and anxiety and is included in the American Thoracic Society's list of patient reported outcome measures for use in ILD [R22-1857, R22-1856]. The HADS (Appendix 10.2) will be self- administered.

For details regarding AE reporting see Section 5.2.6.1.4 and 5.2.6.2.3.

5.2.5.3 Vasculitis assessment

The investigator should monitor for any signs and symptoms of vasculitis at all times and specifically as part of the AE questioning at the time points indicated in the Flow Chart.

In case of (suspected) events of vasculitis, further work-up and management as outlined in Section 4.2.1 has to be followed, including biopsy, appropriate imaging/angiography, laboratory measures (e.g. ESR, additional lab sample for immunological and further inflammation markers, see Section 5.2.3).

For details regarding AE reporting see section 5.2.6.1.4. and 5.2.6.2.3.

5.2.6 Assessment of adverse events

5.2.6.1 Definitions of adverse events

5.2.6.1.1 Adverse event

An adverse event (AE) is defined as any untoward medical occurrence in a patient or clinical investigation subject administered a medicinal product and which does not necessarily have to have a causal relationship with this treatment.

An AE can therefore be any unfavourable and unintended sign (including an abnormal laboratory finding), symptom, or disease temporally associated with the use of a medicinal product, whether considered related or not.

The following should also be recorded as an AE in the CRF and BI SAE form (if applicable):

- Worsening of the underlying disease or of other pre-existing conditions
- Changes in vital signs, ECG, physical examination, and laboratory test results, if they are judged clinically relevant by the investigator

If such abnormalities already pre-exist prior to trial inclusion, they will be considered as baseline conditions and should be collected in the eCRF only.

Adverse event report for diarrhoea events

In case of events of diarrhoea the following definitions should be followed:
Diarrhoea is defined ≥3 loose/liquid stools per day (WHO definition)

5.2.6.1.2 Serious adverse event

A serious adverse event (SAE) is defined as any AE which fulfils at least one of the following criteria:

- Results in death
- Is life-threatening, which refers to an event in which the patient was at risk of death at the time of the event; it does not refer to an event that hypothetically might have caused death if more severe
- Requires inpatient hospitalisation, or prolongation of existing hospitalisation
- Results in persistent or significant disability or incapacity
- Is a congenital anomaly/birth defect
- Is deemed serious for any other reason if it is an important medical event when based upon appropriate medical judgment which may jeopardise the patient and may require medical or surgical intervention to prevent one of the other outcomes listed in the above definitions. Examples of such events are intensive treatment in an emergency room or at home for allergic bronchospasm, blood dyscrasias or convulsions that do not result in hospitalisation or development of dependency or abuse

5.2.6.1.3 AEs considered 'Always Serious'

In accordance with the European Medicines Agency initiative on Important Medical Events, Boehringer Ingelheim has set up a list of AEs, which, by their nature, can always be considered to be 'serious' even though they may not have met the criteria of an SAE as defined above.

The latest list of 'Always Serious AEs' can be found in the eDC system, an electronic data capture system which allows the entry of trial data at the trial site. A copy of the latest list of 'Always Serious AEs' will be provided upon request. These events should always be reported as SAEs as described in Section 5.2.6.2.

Cancers of new histology must be classified as a serious event regardless of the time since discontinuation of the trial medication and must be reported as described in Section 5.2.6.2, subsections 'AE Collection' and '**AE reporting to sponsor and timelines'**.

SAE reporting in case of Suicidal Risk assessed by the C-SSRS:

All C-SSRS reports of suicidal ideation type 4 and 5 and all reports of suicidal behavior must be reported as separate SAEs by the investigator.

For 'self-injurious behavior, no suicidal intent' (type 11) standard AE/SAE reporting rules are to be applied.

For each negative report (Suicidal ideation type 1, 2, or 3) after the start of the trial, the investigator is to decide based on clinical judgement whether it represents an adverse event (AE) as defined in the protocol, and if it is considered an AE then it must be reported accordingly.

5.2.6.1.4 Adverse events of special interest

The term adverse events of special interest (AESI) relates to any specific AE that has been identified at the project level as being of particular concern for prospective safety monitoring and safety assessment within this trial, e.g. the potential for AEs based on knowledge from other compounds in the same class. AESIs need to be reported to the sponsor's Pharmacovigilance Department within the same timeframe that applies to SAEs, please see Section 5.2.6.2.2.

The following are considered as AESIs:

- Potential severe DILI

  A potential severe Drug Induced Liver Injury (DILI) that requires follow-up is defined by the following alterations of hepatic laboratory parameters:
  - o An elevation of AST (aspartate aminotransferase) and/or ALT (alanine aminotransferase) ≥3-fold ULN combined with an elevation of total bilirubin ≥2-fold ULN measured in the same blood sample, or in samples drawn within 30 days of each other, or
  - o Aminotransferase (ALT, and/or AST) elevations ≥10-fold ULN

  These lab findings constitute a hepatic injury alert and the subjects showing these lab abnormalities need to be followed up according to the 'DILI checklist' provided in the ISF. In case of clinical symptoms of hepatic injury (icterus, unexplained encephalopathy, unexplained coagulopathy, right upper quadrant abdominal pain, etc.) without lab results (ALT, AST, total bilirubin) available, the Investigator should make sure that these parameters are analysed, if necessary in an unscheduled blood test. Should the results meet the criteria of hepatic injury alert, the procedures described in the DILI checklist should be followed.

- Vasculitis events

  In this trial protocol vasculitis is defined as any event term included in the MedDRA SMQ Vasculitis (broad). This includes clinical and pathological features related to primary or secondary vasculitis syndromes and involving any type, size, and location of blood vessels.

  The investigator should monitor for any signs and symptoms of vasculitis at all times and specifically as part of the AE questioning.

  In case of (suspected) events of vasculitis, further work-up and management as outlined in Section 4.2.1 has to be followed, including biopsy, appropriate imaging/angiography, laboratory measures (e.g. ESR, additional lab sample for immunological and further inflammation markers).

- Serious infections, opportunistic or mycobacterium tuberculosis infections.

  These include Pneumocystis jirovecii, BK virus disease including polyomavirus-associated nephropathy (PVAN), Cytomegalovirus (CMV), post-transplant lymphoproliferative disorder (Epstein–Barr virus [EBV]), progressive multifocal leucoencephalopathy, bartonellosis (disseminated only), blastomycosis, toxoplasmosis, coccidioidomycosis, histoplasmosis, aspergillosis (invasive only),

candidiasis (invasive or pharyngeal), cryptococcosis, other invasive fungi (mucormycosis (zygomycosis, rhizopus, mucor, lichtheimia), Scedosporium/Pseudallescheria boydii, fusarium), legionellosis, Listeria monocytogenes (invasive only), tuberculosis, nocardiosis, non-tuberculous mycobacterium, salmonellosis (invasive only), HBV reactivation, herpes simplex (invasive only), herpes zoster, strongyloides (hyperinfection syndrome and disseminated forms only), paracoccidioides, Penicillium marneffei, Sporothrix schenckii, cryptosporidium species (chronic only), microsporidiosis, leishmaniasis (visceral only), Trypanosoma cruzi infection (Chagas' disease) (disseminated only), campylobacteriosis (invasive only), shigellosis (invasive only), vibriosis (invasive due to vibrio vulnificus), HCV progression [R17-2617]

- New onset of severe depression, defined as HADS subscore >14
- New onset of severe anxiety, defined as HADS subscore >14

5.2.6.1.5 Intensity (severity) of AEs

The intensity (severity) of the AE should be judged based on the following:

Mild:	Awareness of sign(s) or symptom(s) that is/are easily tolerated
Moderate:	Sufficient discomfort to cause interference with usual activity
Severe:	Incapacitating or causing inability to work or to perform usual activities

5.2.6.1.6 Causal relationship of AEs

Medical judgment should be used to determine whether there is a reasonable possibility of a causal relationship between the AE and the given trial treatment, considering all relevant factors, including pattern of reaction, temporal relationship, de-challenge or re-challenge, confounding factors such as concomitant medication, concomitant diseases and relevant history. An AE for which a causal relationship to the trial treatment is at least reasonably possible (i.e. the relationship cannot be ruled out) is to be classified as drug-related.

Arguments that may suggest that there is a reasonable possibility of a causal relationship could be:

- The event is consistent with the known pharmacology of the drug
- The event is known to be caused by or attributed to the drug class
- A plausible time to onset of the event relative to the time of drug exposure
- Evidence that the event is reproducible when the drug is re-introduced
- No medically sound alternative aetiologies that could explain the event (e.g. pre-existing or concomitant diseases, or co-medications)
- The event is typically drug-related and infrequent in the general population not exposed to drugs (e.g. Stevens-Johnson syndrome)
- An indication of dose-response (i.e. greater effect size if the dose is increased, smaller effect size if dose is reduced)

Arguments that may suggest that there is no reasonable possibility of a causal relationship could be:

- No plausible time to onset of the event relative to the time of drug exposure is evident (e.g. pre-treatment cases, diagnosis of cancer or chronic disease within days / weeks of drug administration; an allergic reaction weeks after discontinuation of the drug concerned)
- Continuation of the event despite the withdrawal of the medication, taking into account the pharmacological properties of the compound (e.g. after 5 half-lives). Of note, this criterion may not be applicable to events whose time course is prolonged despite removing the original trigger
- There is an alternative explanation (e.g. situations where other drugs or underlying diseases appear to provide a more likely explanation for the observed event than the drug concerned
- Disappearance of the event even though the trial drug treatment continues or remains unchanged

5.2.6.2 Adverse event collection and reporting

5.2.6.2.1 AE collection

Upon enrolment into a trial, the subject's baseline condition is assessed (for instance, by documentation of medical history/concomitant diagnoses), and relevant changes from baseline are noted subsequently.

Subjects will be required to report spontaneously any AEs. In addition, each subject will be regularly assessed by the medical staff throughout the clinical trial and whenever the investigator deems necessary. As a minimum, subjects will be questioned for AEs (and concomitant therapies) at the time points indicated in the Flow Chart. Assessment will be made using non-specific questions such as 'How do you feel?'. Specific questions will be asked wherever necessary in order to more precisely describe an AE.

A carefully written record of all AEs shall be kept by the investigator in charge of the trial. Records of AEs shall include data on the time of onset, end time, intensity of the event, and any treatment or action required for the event and its outcome.

The following must be collected and documented on the appropriate CRF(s) by the investigator:

- From signing the informed consent onwards until an individual subject's end of trial (the End of Study (EoS) visit):
    - All AEs (serious and non-serious) and all AESIs
    - The only exception to this rule are AEs (serious and non-serious) and AESIs in Phase I trials in healthy volunteers, when subjects discontinue from the trial due to screening failures prior to administration of any trial medication. In these cases, the subjects' data must be collected at trial site but will not be entered in the CRF and will not be reported in the CTR.

- After the individual subject's end of trial:
    - The investigator does not need to actively monitor the subject for new AEs but should only report any occurrence of cancer and trial treatment related SAEs and trial treatment related AESIs of which the investigator may become aware of by any means of communication, e.g. phone call. Those AEs should be reported on the BI SAE form (see Section 5.2.6.2.2), but not on the CRF.

5.2.6.2.2 AE reporting to the sponsor and timelines

The Investigator must report SAEs, AESIs, and non-serious AEs which are relevant for the reported SAE or AESI, on the BI SAE form to the sponsor's unique entry point within 24 hours of becoming aware of the event, the country specific reporting process will be provided in the ISF. The same timeline applies if follow-up information becomes available. On specific occasions, the Investigator could inform the sponsor upfront via telephone. This does not replace the requirement to complete and send the BI SAE form.

With receipt of any further information to these events, a follow-up SAE form has to be provided. For follow-up information, the same rules and timeline apply as for initial information. All (S)AEs, including those persisting after the individual subject's end of trial, must be followed up until they have resolved, have been sufficiently characterized (e.g. as 'chronic' or 'stable'), or no further information can be obtained.

5.2.6.2.3 AE reporting from depression, anxiety & suicidality assessment

All reports of suicidal ideation type 4 and 5 and all reports of suicidal behaviour (based on C-SSRS questionnaire during the trial, see Section 5.2.5.1), must be reported as separate SAEs by the investigator.

Suicidal ideation type of 1, 2 or 3 based on C-SSRS questionnaire, see Section 5.2.5.1 and signs and symptoms of depression & anxiety based on Hospital Anxiety and Depression Scale (HADS) questionnaire, see Section 5.2.5.2, may fulfil AE definition, see 5.2.6.1 and have to be collected & reported as AEs. All HADS and C-SSRS reports should be reviewed by the Investigator for clinical relevance and determination if an AE report is warranted.

New onset of severe depression, defined as HADS subscore >14 and new onset of severe anxiety, defined as HADS subscore >14 must be reported as AESIs, see Section 5.2.6.1.4.

The Investigator should check any AE resulting from C-SSRS questionnaire with the list of Always Serious AEs (see Section 5.2.6.1.3) and any AEs resulting from HADS questionnaire if AESI criteria are met (see Section 5.2.6.1.4).

5.2.6.2.4 Pregnancy

Once the male subject has been enrolled in the clinical trial and has taken trial medication, and if a partner of the male trial participant becomes pregnant, potential drug exposure during pregnancy must be reported. This requires written consent of the pregnant partner. Reporting and consenting must be in line with local regulations. The ISF will contain the trial specific information and consent for the pregnant partner.

The outcome of the pregnancy associated with the drug exposure during pregnancy must be followed up and reported to the sponsor's unique entry point on the Pregnancy Monitoring Form for Clinical Studies (Part B). The ISF will contain the Pregnancy Monitoring Form for Clinical Studies (Part A and Part B).

As pregnancy itself is not to be reported as an AE, in the absence of an accompanying SAE and/or AESI, only the Pregnancy Monitoring Form for Clinical Studies and not the SAE form is to be completed. If there is an SAE and/or AESI associated with the pregnancy, an SAE form must be completed in addition.

5.3 DRUG CONCENTRATION MEASUREMENTS AND PHARMACOKINETICS

5.3.1 Assessment of pharmacokinetics

For the assessment of pharmacokinetics, blood samples will be collected at the time points indicated in the Flow Chart. The actual sampling times will be recorded and used for determination of pharmacokinetic parameters.

5.3.2 Methods of sample collection

5.3.2.1 Blood sampling for pharmacokinetic analysis of midazolam

For quantification of midazolam concentrations in plasma, 2.7 mL of blood will be drawn from an antecubital or forearm vein into an K_2-EDTA (dipotassium ethylenediaminetetraacetic acid)-anticoagulant blood drawing tube at the times indicated in the Flow Chart. Blood will be withdrawn by means of either an indwelling venous catheter or by venipuncture with a metal needle.

The EDTA-anticoagulated blood samples will be centrifuged for approximately 10 min at approximately 2000 x g to 4000 x g and 4 to 8 °C. Two plasma aliquots will be obtained and stored in polypropylene tubes. The first aliquot should contain at least 0.5 mL of plasma. The process from blood collection until transfer of plasma aliquots into the freezer should be completed in less than 60 min with interim storage of blood samples and aliquots at room temperature. The time each aliquot was placed in the freezer will be documented. Until transfer on dry ice to the analytical laboratory, the aliquots will be stored upright at approximately -20°C or below at the trial site. The second aliquot will be transferred to the analytical laboratory after the bioanalyst has acknowledged safe arrival of the first aliquot. At the analytical laboratory, the plasma samples will be stored at approximately -20°C or below until analysis.

At a minimum, the sample tube labels should list BI trial number, subject number, visit, and planned sampling time.

After analysis, the plasma samples may be used for further methodological investigations (e.g. for stability testing or assessment of metabolites) or to address Health Authority questions regarding the results/methodology. However, only data related to the analyte and/or its metabolite(s) including anti-drug antibodies (if applicable) will be generated by these additional investigations. The trial samples will be discarded after completion of the additional investigations but not later than 5 years after the CTR is archived.

5.3.2.2 Blood sampling for pharmacokinetic analysis of BI 1015550

For quantification of BI 1015550 concentrations in plasma, 2.7 mL of blood will be drawn from an antecubital or forearm vein into an K_2-EDTA (dipotassium ethylenediaminetetraacetic acid)-anticoagulant blood drawing tube at the times indicated in the Flow Chart. Blood will be withdrawn by means of either an indwelling venous catheter or by venipuncture with a metal needle.

The EDTA-anticoagulated blood samples will be centrifuged for approximately 10 min at approximately 2000 x g to 4000 x g and 4 to 8 °C. Two plasma aliquots will be obtained and stored in polypropylene tubes. The first aliquot should contain at least 0.5 mL of plasma. The process from blood collection until transfer of plasma aliquots into the freezer should be completed in less than 60 min with interim storage of blood samples and aliquots at room temperature. The time each aliquot was placed in the freezer will be documented. Until transfer on dry ice to the analytical laboratory, the aliquots will be stored upright at approximately -20°C or below at the trial site. The second aliquot will be transferred to the analytical laboratory after the bioanalyst has acknowledged safe arrival of the first aliquot. At the analytical laboratory, the plasma samples will be stored at approximately -20°C or below until analysis.

At a minimum, the sample tube labels should list BI trial number, subject number, visit, and planned sampling time.

After analysis, the plasma samples may be used for further methodological investigations (e.g. for stability testing or assessment of metabolites) or to address Health Authority questions regarding the results/methodology. However, only data related to the analyte and/or its metabolite(s) including anti-drug antibodies (if applicable) will be generated by these additional investigations. The trial samples will be discarded after completion of the additional investigations but not later than 5 years after the CTR is archived.

[redacted]

[redacted]

[redacted]

[redacted]

5.5 BIOBANKING

Not applicable.

5.6 OTHER ASSESSMENTS

Not applicable.

5.7 APPROPRIATENESS OF MEASUREMENTS

All measurements performed during this trial are standard measurements and will be performed in order to monitor subjects' safety and to determine pharmacokinetic and biomarker parameters in an appropriate way. The scheduled measurements will allow monitoring of changes in vital signs, standard laboratory values, and ECG parameters that might occur as a result of administration of trial medication. The safety assessments are standard, are accepted for evaluation of safety and tolerability of an orally administered drug, and are widely used in clinical trials. The pharmacokinetic parameters and measurements outlined in Section 5.3 are generally used assessments of drug exposure.

6. INVESTIGATIONAL PLAN

6.1 VISIT SCHEDULE

Exact times of measurements outside the permitted time windows will be documented. The acceptable time windows for screening and the end of trial examination are provided in the Flow Chart.

Study measurements and assessments scheduled to occur 'before' trial medication administration on Day 1 are to be performed and completed within a 3 h-period prior to the trial drug administration.

If not stated otherwise in the Flow Chart, the acceptable deviation from the scheduled time for vital signs, ECG, AE questioning, depression & anxiety assessment, suicidality assessment and laboratory tests will be ± 60 min.

If scheduled in the Flow Chart at the same time as a meal, blood sampling, vital signs, and ECG recordings have to be done first. Furthermore, if several measurements including venepuncture are scheduled for the same time, venepuncture should be the last of the measurements due to its inconvenience to the subject and possible influence on physiological parameters.

For planned blood sampling times, refer to the Flow Chart. While these nominal times should be adhered to as closely as possible, the actual sampling times will be recorded and used for the determination of pharmacokinetic parameters.

If a subject misses an appointment, it will be rescheduled if possible. The relevance of measurements outside the permitted time windows will be assessed no later than at the Report Planning Meeting.

6.2 DETAILS OF TRIAL PROCEDURES AT SELECTED VISITS

6.2.1 Screening period

After having been informed about the trial, all subjects will provide written informed consent in accordance with GCP and local legislation prior to enrolment in the trial.

For information regarding laboratory tests (including drug and virus screening), ECG, vital signs, suicidality assessment, depression & anxiety assessment and physical examination, refer to Sections 5.2.1 to 5.2.5.

In accordance with the Flow Chart, duration of screening period is up to 21 days (Day -21 to Day -1 of Visit 1). However, the final review of eligibility criteria is conducted in the morning of Day 1 of Visit 2 prior to predose blood sampling and first drug administration.

6.2.2 Treatment periods

Each subject is expected to participate in 2 treatment periods (Day 1 of Visit 2, Reference Treatment (R)), and Days -13 to 1 of Visit 3 (Test Treatment(T)).

On Day 1 of Visit 2, trial participants will be admitted to the trial site (admission in the preceding evening is also possible) and kept under close medical surveillance for at least 12 h

following drug administration. The subjects will then be allowed to leave the trial site after formal assessment and confirmation of their fitness.

At discretion of the investigator or designee, subjects may stay on Day 1 of Visit 2 overnight at the trial site, and on the next day proceed to Day -13 of Visit 3. [redacted]

On Day -13 of Visit 3 (or in the preceding evening), trial participants will be admitted to the trial site and kept under close medical surveillance for at least 24 h following last drug administration, i.e. until Day 2 of Visit 3. The subjects will then be allowed to leave the trial site after formal assessment and confirmation of their fitness.

For details on time points and procedures for collection of plasma samples for PK analysis and urine samples for PD analysis, refer to Flow Chart and Section 5.3.2.

The safety measurements performed during the treatment period are specified in Section 5.2 of this protocol and in the Flow Chart. AEs and concomitant therapy will be assessed continuously from obtaining subject's written informed consent until the end of trial examination.

For details on times of all other trial procedures, refer to the Flow Chart.

6.2.3 Follow-up period and trial completion

For AE assessment, laboratory tests, recording of ECG and vital signs, depression & anxiety assessment, suicidality assessment and physical examination during the follow-up period, see Section 5.2.

Subjects who discontinue treatment before the end of the planned treatment period should undergo the EoS Visit.

If needed in the opinion of the investigator, additional visits may be scheduled after the EoS Visit for continued safety monitoring.

All abnormal values (including laboratory parameters) that are assessed as clinically relevant by the investigator will be monitored using the appropriate tests until a return to a medically acceptable level is achieved. (S)AEs persisting after a subject's EoS Visit must be followed until they have resolved, have been sufficiently characterised, or no further information can be obtained.

7. STATISTICAL METHODS AND DETERMINATION OF SAMPLE SIZE

7.1 NULL AND ALTERNATIVE HYPOTHESES

The relative bioavailability of midazolam under steady state exposure of BI 1015550 (Test) compared with midazolam alone (Reference) will be estimated by the ratios of the geometric means (test/reference), and their corresponding 2-sided 90% confidence intervals (CIs) will be provided. This method corresponds to the two one-sided t-test procedure, each at the 5% significance level. Since the main focus is on estimation and not testing, a formal hypothesis test and associated acceptance range is not specified.

7.2 PLANNED ANALYSES

7.2.1 General considerations

7.2.1.1 Analysis sets

Statistical analyses will be based on the following analysis sets:

- Treated set (TS): The treated set includes all subjects who were treated with at least one dose of trial drug. The treated set will be used for safety analyses.
- Pharmacokinetic parameter analysis set (PKS): This set includes all subjects in the treated set (TS) who provide at least one PK endpoint that was defined as primary or secondary and was not excluded due to a protocol deviation relevant to the evaluation of PK or due to PK non-evaluability (as specified in the following subsection 'Pharmacokinetics'). Thus, a subject will be included in the PKS, even if he/she contributes only one PK parameter value for one period to the statistical assessment. Descriptive and model-based analyses of PK parameters will be based on the PKS.

Descriptions of additional analysis sets may be provided in the TSAP.

Adherence to the protocol will be assessed by the trial team. Important protocol deviation (IPD) categories will be suggested in the IPD specification file. IPDs will be identified no later than in the Report Planning Meeting, and the IPD categories will be updated as needed.

7.2.1.2 Pharmacokinetics

The pharmacokinetic parameters listed in Section 2.1 and 2.2.2 for drug midazolam and BI 1015550 will be calculated according to the relevant BI internal procedures.

Plasma [redacted] concentration data and parameters of a subject will be included in the statistical pharmacokinetic (PK) analyses if they are not flagged for exclusion due to a protocol deviation relevant to the evaluation of PK (to be decided no later than in the Report Planning Meeting) or due to PK non-evaluability (as revealed during data analysis, based on the criteria specified below). Exclusion of a subject's data will be documented in the CTR.

Important protocol deviations may be

- Incorrect trial medication taken, i.e. the subject received at least one dose of trial medication the subject was not assigned to
- Incorrect dose of trial medication taken
- Use of restricted medications

Plasma [redacted] concentrations and/or parameters of a subject will be considered as non-evaluable, if for example

- The subject experienced emesis that occurred at or before two times median t_{max} of the respective treatment (Median t_{max} is to be determined excluding the subjects experiencing emesis),
- The subject experiences emesis at any time during the labelled dosing interval.
- A predose concentration is >5% C_{max} value of that subject
- Missing samples/concentration data at important phases of PK disposition curve

Plasma [redacted] concentration data and parameters of a subject which are flagged for exclusion will be reported with its individual values but will not be included in the statistical analyses. Descriptive and inferential statistics of PK parameters will be based on the PKS.

Only concentration values within the validated concentration range and actual sampling times will be used for the calculation of pharmacokinetic parameters. Concentrations used in the pharmacokinetic calculations will be in the same format provided in the bioanalytical report, (that is, to the same number of decimal places provided in the bioanalytical report).

[redacted]

[redacted]

7.2.2 Primary endpoint analyses

Primary analyses

The statistical model used for the analysis of the primary endpoints will be an analysis of variance (ANOVA) model on the logarithmic scale. That is, the PK endpoints will be log-transformed (natural logarithm) prior to fitting the ANOVA model. This model will include effects accounting for the sources of variation: treatment. The effect 'subjects' will be considered as random, whereas the treatment effect will be considered as fixed. The model is described by the following equation:

$y_{km} = \mu + \tau_k + s_m + e_{km}$, where

y_{km} = logarithm of response measured on subject m receiving treatment k,

μ = the overall mean,

s_m = the effect associated with the m^{th} subject, m = 1, 2, ..., n

τ_k = the k^{th} treatment effect, k = 1, 2,

e_{km} = the random error associated with the m^{th} subject who received treatment k.

where $s_m \sim N(0, \sigma_B^2)$ i.i.d., $e_{km} \sim N(0, \sigma_W^2)$ i.i.d. and s_m, e_{km} are independent random variables.

Point estimates for the ratios of the geometric means (test/reference) for the primary endpoints (see Section 2.1) and their two-sided 90% confidence intervals (CIs) will be provided.

For each endpoint, the difference between the expected means for log(T)-log(R) will be estimated by the difference in the corresponding adjusted means (Least Squares Means). Additionally their two-sided 90% confidence intervals will be calculated based on the residual error from the ANOVA and quantiles from the t-distribution. These quantities will then be back-transformed to the original scale to provide the point estimate and 90% CIs for each endpoint.

7.2.3 Secondary endpoint analyses

The secondary endpoints (refer to Section 2.1.3) will be calculated according to the relevant BI internal procedures and will be assessed statistically using the same methods as described for the primary endpoints.

7.2.5 Safety analyses

Safety will be analysed based on the assessments described in Section 2.2.2.3. All treated subjects (TS, refer to Section 7.2) will be included in the safety analysis. Safety analyses will be descriptive in nature and based on BI standards. No hypothesis testing is planned.

For all analyses, the treatment actually administered (= treatment at onset) to the subject will be used (any deviations from the randomised treatment will be discussed in the minutes of the Report Planning Meeting).

Treatments will be compared in a descriptive way. Tabulations of frequencies/proportions will be used to evaluate categorical (qualitative) data, and tabulations of descriptive statistics will be used to analyse continuous (quantitative) data.

Measurements (such as ECG, vital signs, or laboratory parameters) or AEs will be assigned to treatments (see Section 4.1) based on the actual treatment at the time of the measurement or on the recorded time of AE onset (concept of treatment emergent AEs). Therefore, measurements performed or AEs recorded prior to first intake of trial medication will be assigned to the screening period, those between first trial medication intake and end of REP (see Section 1.2.3) will be assigned to the treatment period. Events occurring after the REP but prior to next intake or end of trial termination date will be assigned to 'follow-up'. In case of two or more treatments, the follow-up will be summarized according to the previous treatment. These assignments including the corresponding time intervals will be defined in detail in the TSAP. Note that AEs occurring after the last per protocol contact but entered before unblinding the trial will be reported to Pharmacovigilance only and will not be captured in the trial database.

Additionally, further treatment intervals (analysing treatments) may be defined in the TSAP in order to provide summary statistics for time intervals, such as combined treatments, on-treatment totals, or periods without treatment effects (such as screening and follow-up intervals).

Adverse events will be coded using the Medical Dictionary for Regulatory Activities (MedDRA). Frequency, severity, and causal relationship of AEs will be tabulated by treatment, system organ class, and preferred term. SAEs, AESIs (see Section 5.2.6.1), and other significant AEs (according to ICH E3) will be listed separately.

Previous and concomitant therapies will be presented per treatment group without consideration of time intervals and treatment periods.

Laboratory data will be compared to their reference ranges. Values outside the reference range as well as possibly clinically significant values will be highlighted in the listings. Additionally, differences from baseline will be evaluated.
Vital signs or other safety-relevant data will be assessed with regard to possible on-treatment changes from baseline.

Results regarding the C-SSRS and HADS will only be listed.

7.2.6 Interim analyses

No interim analysis is planned.

7.3 HANDLING OF MISSING DATA

7.3.1 Safety

It is not planned to impute missing values for safety parameters.

7.3.2 Pharmacokinetics

Handling of missing PK data will be performed according to the relevant BI internal procedures.

PK parameters that cannot be reasonably calculated based on the available drug concentration-time data will not be imputed.

7.4 RANDOMISATION

The trial will not be randomised, thus this Section is not applicable.

7.5 DETERMINATION OF SAMPLE SIZE

It is planned to enter a total of 15 subjects in the trial, including up to three dropouts or non PK evaluable subjects, i.e. at least 12 evaluable subjects are expected. This sample size is considered sufficient to achieve the aims of this exploratory trial. With this sample size, the following precision in estimating the ratio of geometric means (test/reference) can be expected with 95% probability. Precision is defined as the ratio of upper CI limit to the relative BA estimate. Note that the precision is independent of the actual ratio of geometric means.

For various assumptions around the gCV of 25%, Table 7.5: 1 provides an overview of the achievable precision for estimating the ratio of geometric means (test/reference). For illustrative purposes, the expected 90% confidence intervals are displayed for different values of the ratios T/R of geometric means.

Table 7.5: 1 Precision that can be expected with 95% probability and illustrative two-sided 90% confidence intervals around the ratios of geometric means (T/R) for different gCVs in a two-period fixed sequence design trial *(N=12 evaluable subjects)*

gCV [%]	Precision upper CL / relative BA estimate	Ratio [%]*	Lower CL [%]	Upper CL [%]
10	1.10	80	72.55	88.22
10	1.10	100	90.68	110.28
10	1.10	125	113.35	137.84
10	1.10	150	136.02	165.41
15	1.16	80	69.11	92.60
15	1.16	100	86.39	115.75
15	1.16	125	107.99	144.69
15	1.16	150	129.59	173.63
20	1.21	80	65.88	97.15
20	1.21	100	82.35	121.43
20	1.21	125	102.94	151.79
20	1.21	150	123.53	182.15
25	1.27	80	62.84	101.85
25	1.27	100	78.55	127.31
25	1.27	125	98.19	159.13
25	1.27	150	117.83	190.96

*Ratio of geometric means (test/reference) for a PK endpoint is defined by $\exp(\mu_T)/\exp(\mu_R)$.

The expected 90% confidence interval limits in the table were derived by

$$\text{CI limit}_{\text{upper,lower}} = \exp(\ln(\theta) \pm \omega),$$

with θ being the ratio (T/R) on original scale and ω the distance from the estimate θ to either confidence interval limit on the log-scale, which was obtained from the achievable precision on the original scale.

The calculation was performed as described by Julious [R11-5230] using R Version 4.0.1.

8. INFORMED CONSENT, TRIAL RECORDS, DATA PROTECTION, PUBLICATION POLICY, AND ADMINISTRATIVE STRUCTURE

The trial will be carried out in compliance with the protocol, the ethical principles laid down in the Declaration of Helsinki, in accordance with the ICH Harmonized Guideline for Good Clinical Practice (GCP), relevant BI Standard Operating Procedures (SOPs), the EU directive 2001/20/EC and other relevant regulations. Investigators and site staff must adhere to these principles. Deviation from the protocol, the principles of ICH GCP or applicable regulations will be treated as 'protocol deviation'.

Standard medical care (prophylactic, diagnostic, and therapeutic procedures) remains the responsibility of the subject's treating physician.

The investigator will inform the sponsor immediately of any urgent safety measures taken to protect the trial subjects against any immediate hazard, as well as of any serious breaches of the protocol or of ICH GCP.

The Boehringer Ingelheim transparency and publication policy can be found on the following web page: trials.boehringer-ingelheim.com. The rights of the investigator and of the sponsor with regard to publication of the results of this trial are described in the investigator contract. As a general rule, no trial results should be published prior to finalisation of the CTR.

The terms and conditions of the insurance coverage are made available to the investigator and the subjects and are stored in the ISF.

8.1 TRIAL APPROVAL, SUBJECT INFORMATION, INFORMED CONSENT

This trial will be initiated only after all required legal documentation has been reviewed and approved by the respective Institutional Review Board (IRB / Independent Ethics Committee (IEC and competent authority (CA) according to national and international regulations. The same applies for the implementation of changes introduced by amendments.

Prior to a subject's participation in the trial, written informed consent must be obtained from each subject according to ICH-GCP and to the regulatory and legal requirements of the participating country. Each signature must be personally dated by each signatory and the informed consent and any additional subject-information form retained by the investigator as part of the trial records. A signed copy of the informed consent and any additional subject information must be given to each subject.

The subject must be given sufficient time to consider participation in the trial. The investigator or delegate obtains written consent of the subject's own free will with the informed consent form after confirming that the subject understands the contents. The investigator or [redacted] delegate must sign (or place a seal on) and date the informed consent form. If a trial collaborator has given a supplementary explanation, the trial collaborator also signs (or places a seal on) and dates the informed consent.

Re-consenting may become necessary when new relevant information becomes available and should be conducted according to the sponsor's instructions.

The consent and re-consenting process should be properly documented in the source documentation.

8.2 DATA QUALITY ASSURANCE

A risk-based approach is used for trial quality management. It is initiated by the assessment of critical data and processes for trial subject protection and reliability of the results as well as identification and assessment of associated risks. An Integrated Quality and Risk Management Plan or alternative plan, in line with the guidance provided by ICH Q9 and ICH-GCP E6, for fully outsourced trials, documents the rationale and strategies for risk management during trial conduct including monitoring approaches, vendor management and other processes focusing on areas of greatest risk.

Continuous risk review and assessment may lead to adjustments in trial conduct, trial design or monitoring approaches.

A quality assurance audit/inspection of this trial may be conducted by the sponsor, sponsor's designees, or by IRB / IEC or by regulatory authorities. The quality assurance auditor will have access to all medical records, the investigator's trial-related files and correspondence, and the informed consent documentation of this clinical trial.

8.3 RECORDS

CRFs for individual subjects will be provided by the sponsor. For drug accountability, refer to Section 4.1.8.

8.3.1 Source documents

In accordance with regulatory requirements, the investigator should prepare and maintain adequate and accurate source documents and trial records for each trial subject that include all observations and other data pertinent to the investigation. Source data as well as reported data should follow the 'ALCOA principles' and be attributable, legible, contemporaneous, original, and accurate. Changes to the data should be traceable (audit trail).

Data reported on the CRF must be consistent with the source data or the discrepancies must be explained.

The current medical history of the subject may not be sufficient to confirm eligibility for the trial and the investigator may need to request previous medical histories and evidence of any diagnostic tests. In this case, the investigator must make at least one documented attempt to retrieve previous medical records. If this fails, a verbal history from the subject, documented in their medical records, would be acceptable.

Before providing any copy of subjects' source documents to the sponsor, the investigator must ensure that all subject identifiers (e.g., subject's name, initials, address, phone number, and social security number) have properly been removed or redacted to ensure subject confidentiality.

If the subject is not compliant with the protocol, any corrective action (e.g. re-training) must be documented in the subject file.

For the CRF, data must be derived from source documents, for example:

- Subject identification: gender, year of birth (in accordance with local laws and regulations)
- Subject participation in the trial (substance, trial number, subject number, date subject was informed)
- Dates of subject's visits, including dispensing of trial medication
- Medical history (including trial indication and concomitant diseases, if applicable)
- Medication history
- AEs and outcome events (onset date [mandatory], and end date [if available])
- SAEs (onset date [mandatory], and end date [if available])
- Concomitant therapy (start date, changes)
- Originals or copies of laboratory results and other imaging or testing results, with proper documented medical evaluation (in validated electronic format, if available)
- ECG results (original or copies of printouts)
- Completion of subject's participation in the trial (end date; in case of premature discontinuation, document the reason for it, if known)
- Prior to allocation of a subject to a treatment into a clinical trial, there must be documented evidence in the source data (e.g. medical records) that the trial participant meets all inclusion criteria and does not meet any exclusion criteria. The absence of records (either medical records, verbal documented feedback of the subject or testing conducted specific for a protocol) to support inclusion/exclusion criteria does not make the subject eligible for the clinical trial.

8.3.2 Direct access to source data and documents

The investigator/institution will allow site trial-related monitoring, audits, IRB / IEC review and regulatory inspections. Direct access must be provided to the CRF and all source documents/data, including progress notes, copies of laboratory and medical test results, which must be available at all times for review by the Clinical Research Associate, auditor and regulatory inspector (e.g. FDA). They may review all CRFs and informed consents. The accuracy of the data will be verified by direct comparison with the source documents described in Section 8.3.1. The sponsor will also monitor compliance with the protocol and GCP.

8.3.3 Storage period of records

Trial site:
The trial site(s) must retain the source and essential documents (including ISF) according to contract or the local requirements valid at the time of the end of the trial (whatever is longer).

Sponsor:
The sponsor must retain the essential documents according to the sponsor's SOPs.

8.4 EXPEDITED REPORTING OF ADVERSE EVENTS

BI is responsible to fulfil their legal and regulatory reporting obligation in accordance with regulatory requirements.

8.5 STATEMENT OF CONFIDENTIALITY AND SUBJECT PRIVACY

Data protection and data security measures are implemented for the collection, storage and processing of subject data in accordance with the principles 7 and 12 of the WHO GCP handbook.

Individual subject data obtained as a result of this trial is considered confidential and disclosure to third parties is prohibited with the following exceptions:
Personalised treatment data may be given to the subject's personal physician or to other appropriate medical personnel responsible for the subject's welfare. Data generated at the site as a result of the trial need to be available for inspection on request by the participating physicians, the sponsor's representatives, by the IRB / IEC and the regulatory authorities.

8.5.1 Collection, storage and future use of biological samples and corresponding data

Measures are in place to comply with the applicable rules for the collection, storage and future use of biological samples and clinical data, in particular

- Sample and data usage have to be in accordance with the informed consent
- The BI-internal facilities storing biological samples from clinical trial participants as well as the external storage facility are qualified for the storage of biological samples collected in clinical trials.
- An appropriate sample and data management system, incl. audit trail for clinical data and samples to identify and destroy such samples according to ICF is in place
- A fit for the purpose documentation (e.g. biomarker proposal, analysis plan and report) ensures compliant usage
- A fit for purpose approach will be used for assay/equipment validation depending on the intended use of the biomarker data
- Samples and/or data may be transferred to third parties and other countries as specified in the ICF

8.6 TRIAL MILESTONES

The start of the trial is defined as the date when the first subject in the whole trial signs informed consent.

The end of the trial is defined as the date of the last visit of the last subject in the whole trial.

Early termination of the trial is defined as the premature termination of the trial due to any reason before the end of the trial as specified in this protocol.

Temporary halt of the trial is defined as any unplanned interruption of the trial by the sponsor with the intention to resume it.

Suspension of the trial is defined as an interruption of the trial based on a Health Authority request.

The IEC / competent authority in each participating EU member state will be notified about the trial milestones according to the laws of each member state.

A final report of the clinical trial data will be written only after all subjects have completed the trial in all countries (EU or non-EU), so that all data can be incorporated and considered in the report.

The sponsor will submit to the EU database a summary of the final trial results within one year from the end of a clinical trial as a whole, regardless of the country of the last subject (EU or non-EU).

8.7 ADMINISTRATIVE STRUCTURE OF THE TRIAL

The trial is sponsored by Boehringer Ingelheim (BI).

The trial will be conducted at the [redacted], under the supervision of the Principal Investigator. Relevant documentation on the participating (Principal) Investigators (e.g. their curricula vitae) will be filed in the ISF. The investigators will have access to the BI web portal Clinergize to access documents provided by the sponsor.

BI has appointed a Clinical Trial Leader (CT Leader), responsible for coordinating all required trial activities, in order to

- Manage the trial in accordance with applicable regulations and internal SOPs
- Direct the clinical trial team in the preparation, conduct, and reporting of the trial
- Ensure appropriate training and information of local Clinical Trial Mangers (CT Managers), Clinical Research Associates (CRAs), and investigators of participating trial sites

The trial medication will be provided by the [redacted], or will be obtained by the clinical trial site from public pharmacy (midazolam).

Safety laboratory tests will be performed by the local laboratory of the trial site ([redacted]).

Analyses of BI 1015550 concentrations in plasma will be performed at [redacted].
Analyses of Midazolam and OH Midazolam concentrations in plasma will be performed at [redacted]

Analyses of 6ß-OH-cortisol and cortisol concentrations in urine will be performed at [redacted].

On-site monitoring will be performed by BI or a contract research organisation appointed by BI.

Data management and statistical evaluation will be done by BI according to BI SOPs.

Tasks and functions assigned in order to organise, manage, and evaluate the trial are defined according to BI SOPs. A list of responsible persons and relevant local information can be found in the ISF.

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10. APPENDICES

10.1 COLUMBIA-SUICIDE SEVERITY RATING SCALE

COLUMBIA-SUICIDE SEVERITY RATING SCALE (C-SSRS)

Baseline/Screening Version

Version 1/14/09

Posner, K.; Brent, D.; Lucas, C.; Gould, M.; Stanley, B.; Brown, G.; Fisher, P.; Zelazny, J.; Burke, A.; Oquendo, M.; Mann, J.

Disclaimer:

This scale is intended to be used by individuals who have received training in its administration. The questions contained in the Columbia-Suicide Severity Rating Scale are suggested probes. Ultimately, the determination of the presence of suicidal ideation or behavior depends on the judgment of the individual administering the scale.

Definitions of behavioral suicidal events in this scale are based on those used in ***The Columbia Suicide History Form****, developed by* [redacted] *Risk factors for suicidal behavior: utility and limitations of research instruments. In M.B. First [Ed.]* Standardized Evaluation in Clinical Practice, *pp. 103 -130, 2003.)*

For reprints of the C-SSRS contact [redacted] *1051* [redacted] *10032; inquiries and training requirements contact posnerk@nyspi.columbia.edu*

SUICIDAL IDEATION		
Ask questions 1 and 2. If both are negative, proceed to "Suicidal Behavior" section. If the answer to question 2 is "yes", ask questions 3, 4 and 5. If the answer to question 1 and/or 2 is "yes", complete "Intensity of Ideation" section below.	**Lifetime: Time He/She Felt Most Suicidal**	**Past Months**
1. Wish to be Dead Subject endorses thoughts about a wish to be dead or not alive anymore, or wish to fall asleep and not wake up. ***Have you wished you were dead or wished you could go to sleep and not wake up?*** If yes, describe:	Yes ☐ No ☐	Yes ☐ No ☐
2. Non-Specific Active Suicidal Thoughts General non-specific thoughts of wanting to end one's life/commit suicide (e.g., *"I've thought about killing myself"*) without thoughts of ways to kill oneself/associated methods, intent, or plan during the assessment period. ***Have you actually had any thoughts of killing yourself?*** If yes, describe:	Yes ☐ No ☐	Yes ☐ No ☐
3. Active Suicidal Ideation with Any Methods (Not Plan) without Intent to Act Subject endorses thoughts of suicide and has thought of at least one method during the assessment period. This is different than a specific plan with time, place or method details worked out (e.g. thought of method to kill self but not a specific plan). Includes person who would say, *"I thought about taking an overdose but I never made a specific plan as to when, where or how I would actually do it...and I would never go through with it."* ***Have you been thinking about how you might do this?*** If yes, describe:	Yes ☐ No ☐	Yes ☐ No ☐
4. Active Suicidal Ideation with Some Intent to Act, without Specific Plan Active suicidal thoughts of killing oneself and subject reports having some intent to act on such thoughts, as opposed to *"I have the thoughts but I definitely will not do anything about them."* ***Have you had these thoughts and had some intention of acting on them?*** If yes, describe:	Yes ☐ No ☐	Yes ☐ No ☐
5. Active Suicidal Ideation with Specific Plan and Intent Thoughts of killing oneself with details of plan fully or partially worked out and subject has some intent to carry it out. ***Have you started to work out or worked out the details of how to kill yourself? Do you intend to carry out this plan?*** If yes, describe:	Yes ☐ No ☐	Yes ☐ No ☐
INTENSITY OF IDEATION		
The following features should be rated with respect to the most severe type of ideation (i.e., 1-5 from above, with 1 being the least severe and 5 being the most severe). Ask about time he/she was feeling the most suicidal. Lifetime - ***Most Severe Ideation:*** _____ (*Type # (1-5)*) _____ (*Description of Ideation*) Past X Months - ***Most Severe Ideation:*** _____ (*Type # (1-5)*) _____ (*Description of Ideation*)	Most Severe	Most Severe
Frequency ***How many times have you had these thoughts?*** (1) Less than once a week (2) Once a week (3) 2-5 times in week (4) Daily or almost daily (5) **Many times each day**	___	___
Duration ***When you have the thoughts how long do they last?*** (1) Fleeting - few seconds or minutes (2) Less than 1 hour/some of the time (3) 1-4 hours/a lot of time (4) 4-8 hours/most of day (5) More than 8 hours/persistent or continuous	___	___
Controllability ***Could/can you stop thinking about killing yourself or wanting to die if you want to?*** (1) Easily able to control thoughts (2) Can control thoughts with little difficulty (3) Can control thoughts with some difficulty (4) Can control thoughts with a lot of difficulty (5) Unable to control thoughts (0) Does not attempt to control thoughts	___	___
Deterrents ***Are there things - anyone or anything (e.g., family, religion, pain of death) - that stopped you from wanting to die or acting on thoughts of committing suicide?*** (1) Deterrents definitely stopped you from attempting suicide (2) Deterrents probably stopped you (3) Uncertain that deterrents stopped you (4) Deterrents most likely did not stop you (5) Deterrents definitely did not stop you (0) Does not apply	___	___
Reasons for Ideation ***What sort of reasons did you have for thinking about wanting to die or killing yourself? Was it to end the pain or stop the way you were feeling (in other words you couldn't go on living with this pain or how you were feeling) or was it to get attention, revenge or a reaction from others? Or both?*** (1) Completely to get attention, revenge or a reaction from others (2) Mostly to get attention, revenge or a reaction from others (3) Equally to get attention, revenge or a reaction from others and to end stop the pain (4) Mostly to end or stop the pain (you couldn't go on living with the pain or how you were feeling) (5) Completely to end or stop the pain (you couldn't go on living with the pain or how you were feeling) (0) Does not apply	___	___
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SUICIDAL BEHAVIOR *(Check all that apply; so long as these are separate events; must ask about all types)*	**Lifetime**	**Past __ Years**
Actual Attempt: A potentially self-injurious act committed with at least some wish to die, *as a result of act*. Behavior was in part thought of as method to kill oneself. Intent does not have to be 100%. If there is *any* intent/desire to die associated with the act, then it can be considered an actual suicide attempt. ***There does not have to be any injury or harm***, just the potential for injury or harm. If person pulls trigger while gun is in mouth but gun is broken so no injury results, this is considered an attempt. Inferring Intent: Even if an individual denies intent/wish to die, it may be inferred clinically from the behavior or circumstances. For example, a highly lethal act that is clearly not an accident so no other intent but suicide can be inferred (e.g., gunshot to head, jumping from window of a high floor/story). Also, if someone denies intent to die, but they thought that what they did could be lethal, intent may be inferred. ***Have you made a suicide attempt?*** ***Have you done anything to harm yourself?*** ***Have you done anything dangerous where you could have died?*** ***What did you do?*** ***Did you_____ as a way to end your life?*** ***Did you want to die (even a little) when you_____?*** ***Were you trying to end your life when you _____?*** ***Or Did you think it was possible you could have died from_____?*** ***Or did you do it purely for other reasons / without ANY intention of killing yourself (like to relieve stress, feel better, get sympathy, or get something else to happen)?*** (Self-Injurious Behavior without suicidal intent) If yes, describe:	Yes No ☐ ☐ Total # of Attempts _____	Yes No ☐ ☐ Total # of Attempts _____
Has subject engaged in Non-Suicidal Self-Injurious Behavior?	Yes No ☐ ☐	Yes No ☐ ☐
Interrupted Attempt: When the person is interrupted (by an outside circumstance) from starting the potentially self-injurious act *(if not for that, actual attempt would have occurred)*. Overdose: Person has pills in hand but is stopped from ingesting. Once they ingest any pills, this becomes an attempt rather than an interrupted attempt. Shooting: Person has gun pointed toward self, gun is taken away by someone else, or is somehow prevented from pulling trigger. Once they pull the trigger, even if the gun fails to fire, it is an attempt. Jumping: Person is poised to jump, is grabbed and taken down from ledge. Hanging: Person has noose around neck but has not yet started to hang - is stopped from doing so. ***Has there been a time when you started to do something to end your life but someone or something stopped you before you actually did anything?*** If yes, describe:	Yes No ☐ ☐ Total # of interrupted _____	Yes No ☐ ☐ Total # of interrupted _____
Aborted Attempt: When person begins to take steps toward making a suicide attempt, but stops themselves before they actually have engaged in any self-destructive behavior. Examples are similar to interrupted attempts, except that the individual stops him/herself, instead of being stopped by something else. ***Has there been a time when you started to do something to try to end your life but you stopped yourself before you actually did anything?*** If yes, describe:	Yes No ☐ ☐ Total # of aborted _____	Yes No ☐ ☐ Total # of aborted _____
Preparatory Acts or Behavior: Acts or preparation towards imminently making a suicide attempt. This can include anything beyond a verbalization or thought, such as assembling a specific method (e.g., buying pills, purchasing a gun) or preparing for one's death by suicide (e.g., giving things away, writing a suicide note). ***Have you taken any steps towards making a suicide attempt or preparing to kill yourself (such as collecting pills, getting a gun, giving valuables away or writing a suicide note)?*** If yes, describe:	Yes No ☐ ☐	Yes No ☐ ☐
Suicidal Behavior: Suicidal behavior was present during the assessment period?	Yes No ☐ ☐	Yes No ☐ ☐

Answer for Actual Attempts Only	Most Recent Attempt Date:	Most Lethal Attempt Date:	Initial/First Attempt Date:
Actual Lethality/Medical Damage: 0. No physical damage or very minor physical damage (e.g., surface scratches). 1. Minor physical damage (e.g., lethargic speech; first-degree burns; mild bleeding; sprains). 2. Moderate physical damage; medical attention needed (e.g., conscious but sleepy, somewhat responsive; second-degree burns; bleeding of major vessel). 3. Moderately severe physical damage; *medical* hospitalization and likely intensive care required (e.g., comatose with reflexes intact; third-degree burns less than 20% of body; extensive blood loss but can recover; major fractures). 4. Severe physical damage; *medical* hospitalization with intensive care required (e.g., comatose without reflexes; third-degree burns over 20% of body; extensive blood loss with unstable vital signs; major damage to a vital area). 5. Death	*Enter Code* _____	*Enter Code* _____	*Enter Code* _____
Potential Lethality: Only Answer if Actual Lethality=0 Likely lethality of actual attempt if no medical damage (the following examples, while having no actual medical damage, had potential for very serious lethality: put gun in mouth and pulled the trigger but gun fails to fire so no medical damage; laying on train tracks with oncoming train but pulled away before run over). 0 = Behavior not likely to result in injury 1 = Behavior likely to result in injury but not likely to cause death 2 = Behavior likely to result in death despite available medical care	*Enter Code* _____	*Enter Code* _____	*Enter Code* _____

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COLUMBIA-SUICIDE SEVERITY RATING SCALE (C-SSRS)

Since Last Visit

Version 1/14/09

Posner, K.; Brent, D.; Lucas, C.; Gould, M.; Stanley, B.; Brown, G.; Fisher, P.; Zelazny, J.; Burke, A.; Oquendo, M.; Mann, J.

Disclaimer:

This scale is intended to be used by individuals who have received training in its administration. The questions contained in the Columbia-Suicide Severity Rating Scale are suggested probes. Ultimately, the determination of the presence of suicidal ideation or behavior depends on the judgment of the individual administering the scale.

Definitions of behavioral suicidal events in this scale are based on those used in ***The Columbia Suicide History Form****, developed by* [redacted] *Risk factors for suicidal behavior: utility and limitations of research instruments. In M.B. First [Ed.]* Standardized Evaluation in Clinical Practice, *pp. 103 -130, 2003.)*

For reprints of the C-SSRS contact [redacted] *1051* [redacted] *10032; inquiries and training requirements contact posnerk@nyspi.columbia.edu*

SUICIDAL IDEATION

Ask questions 1 and 2. If both are negative, proceed to "Suicidal Behavior" section. If the answer to question 2 is "yes", ask questions 3, 4 and 5. If the answer to question 1 and/or 2 is "yes", complete "Intensity of Ideation" section below.

Since Last Visit

1. Wish to be Dead — Yes ☐ No ☐
Subject endorses thoughts about a wish to be dead or not alive anymore, or wish to fall asleep and not wake up.
Have you wished you were dead or wished you could go to sleep and not wake up?
If yes, describe:

2. Non-Specific Active Suicidal Thoughts — Yes ☐ No ☐
General, non-specific thoughts of wanting to end one's life/commit suicide (e.g., *"I've thought about killing myself"*) without thoughts of ways to kill oneself/associated methods, intent, or plan during the assessment period.
Have you actually had any thoughts of killing yourself?
If yes, describe:

3. Active Suicidal Ideation with Any Methods (Not Plan) without Intent to Act — Yes ☐ No ☐
Subject endorses thoughts of suicide and has thought of at least one method during the assessment period. This is different than a specific plan with time, place or method details worked out (e.g., thought of method to kill self but not a specific plan). Includes person who would say, *"I thought about taking an overdose but I never made a specific plan as to when, where or how I would actually do it...and I would never go through with it."*
Have you been thinking about how you might do this?
If yes, describe:

4. Active Suicidal Ideation with Some Intent to Act, without Specific Plan — Yes ☐ No ☐
Active suicidal thoughts of killing oneself and subject reports having some intent to act on such thoughts, as opposed to *"I have the thoughts but I definitely will not do anything about them."*
Have you had these thoughts and had some intention of acting on them?
If yes, describe:

5. Active Suicidal Ideation with Specific Plan and Intent — Yes ☐ No ☐
Thoughts of killing oneself with details of plan fully or partially worked out and subject has some intent to carry it out.
Have you started to work out or worked out the details of how to kill yourself? Do you intend to carry out this plan?
If yes, describe:

INTENSITY OF IDEATION

The following features should be rated with respect to the most severe type of ideation (i.e., 1-5 from above, with 1 being the least severe and 5 being the most severe).

Most Severe

Most Severe Ideation: ____ _____
Type # (1-5) ***Description of Ideation***

Frequency — ____
How many times have you had these thoughts?
(1) Less than once a week (2) Once a week (3) 2-5 times in week (4) Daily or almost daily (5) Many times each day

Duration — ____
When you have the thoughts, how long do they last?
(1) Fleeting - few seconds or minutes
(2) Less than 1 hour/some of the time
(3) 1-4 hours/a lot of time
(4) 4-8 hours/most of day
(5) More than 8 hours/persistent or continuous

Controllability — ____
Could/can you stop thinking about killing yourself or wanting to die if you want to?
(1) Easily able to control thoughts
(2) Can control thoughts with little difficulty
(3) Can control thoughts with some difficulty
(4) Can control thoughts with a lot of difficulty
(5) Unable to control thoughts
(0) Does not attempt to control thoughts

Deterrents — ____
Are there things - anyone or anything (e.g., family, religion, pain of death) - that stopped you from wanting to die or acting on thoughts of committing suicide?
(1) Deterrents definitely stopped you from attempting suicide
(2) Deterrents probably stopped you
(3) Uncertain that deterrents stopped you
(4) Deterrents most likely did not stop you
(5) Deterrents definitely did not stop you
(0) Does not apply

Reasons for Ideation — ____
What sort of reasons did you have for thinking about wanting to die or killing yourself? Was it to end the pain or stop the way you were feeling (in other words you couldn't go on living with this pain or how you were feeling) or was it to get attention, revenge or a reaction from others? Or both?
(1) Completely to get attention, revenge or a reaction from others
(2) Mostly to get attention, revenge or a reaction from others
(3) Equally to get attention, revenge or a reaction from others and to end/stop the pain
(4) Mostly to end or stop the pain (you couldn't go on living with the pain or how you were feeling)
(5) Completely to end or stop the pain (you couldn't go on living with the pain or how you were feeling)
(0) Does not apply

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SUICIDAL BEHAVIOR *(Check all that apply; so long as there are separate events; must ask about all types)*	**Since Last Visit**
Actual Attempt: A potentially self-injurious act committed with at least some wish to die, *as a result of act*. Behavior was in part thought of as method to kill oneself. Intent does not have to be 100%. If there is *any* intent/desire to die associated with the act, then it can be considered an actual suicide attempt. ***There does not have to be any injury or harm***, just the potential for injury or harm. If person pulls trigger while gun is in mouth but gun is broken so no injury results, this is considered an attempt. Inferring Intent: Even if an individual denies intent/wish to die, it may be inferred clinically from the behavior or circumstances. For example, a highly lethal act that is clearly not an accident so no other intent but suicide can be inferred (e.g., gunshot to head, jumping from window of a high floor/story). Also, if someone denies intent to die, but they thought that what they did could be lethal, intent may be inferred. ***Have you made a suicide attempt?*** ***Have you done anything to harm yourself?*** ***Have you done anything dangerous where you could have died?*** ***What did you do?*** ***Did you_____ as a way to end your life?*** ***Did you want to die (even a little) when you_____?*** ***Were you trying to end your life when you _____?*** ***Or did you think it was possible you could have died from_____?*** ***Or did you do it purely for other reasons / without ANY intention of killing yourself (like to relieve stress, feel better, get sympathy, or get something else to happen)?*** (Self-Injurious Behavior without suicidal intent) If yes, describe:	Yes ☐ No ☐ Total # of Attempts _____
Has subject engaged in Non-Suicidal Self-Injurious Behavior?	Yes ☐ No ☐
Interrupted Attempt: When the person is interrupted (by an outside circumstance) from starting the potentially self-injurious act *(if not for that, actual attempt would have occurred)*. Overdose: Person has pills in hand but is stopped from ingesting. Once they ingest any pills, this becomes an attempt rather than an interrupted attempt. Shooting: Person has gun pointed toward self, gun is taken away by someone else, or is somehow prevented from pulling trigger. Once they pull the trigger, even if the gun fails to fire, it is an attempt. Jumping: Person is poised to jump, is grabbed and taken down from ledge. Hanging: Person has noose around neck but has not yet started to hang - is stopped from doing so. ***Has there been a time when you started to do something to end your life but someone or something stopped you before you actually did anything?*** If yes, describe:	Yes ☐ No ☐ Total # of interrupted _____
Aborted Attempt: When person begins to take steps toward making a suicide attempt, but stops themselves before they actually have engaged in any self-destructive behavior. Examples are similar to interrupted attempts, except that the individual stops him/herself, instead of being stopped by something else. ***Has there been a time when you started to do something to try to end your life but you stopped yourself before you actually did anything?*** If yes, describe:	Yes ☐ No ☐ Total # of aborted _____
Preparatory Acts or Behavior: Acts or preparation towards imminently making a suicide attempt. This can include anything beyond a verbalization or thought, such as assembling a specific method (e.g., buying pills, purchasing a gun) or preparing for one's death by suicide (e.g., giving things away, writing a suicide note). ***Have you taken any steps towards making a suicide attempt or preparing to kill yourself (such as collecting pills, getting a gun, giving valuables away or writing a suicide note)?*** If yes, describe:	Yes ☐ No ☐
Suicidal Behavior: Suicidal behavior was present during the assessment period?	Yes ☐ No ☐
Suicide:	Yes ☐ No ☐
Answer for Actual Attempts Only	Most Lethal Attempt Date:
Actual Lethality/Medical Damage: 0. No physical damage or very minor physical damage (e.g., surface scratches). 1. Minor physical damage (e.g., lethargic speech; first-degree burns; mild bleeding; sprains). 2. Moderate physical damage; medical attention needed (e.g., conscious but sleepy, somewhat responsive; second-degree burns; bleeding of major vessel). 3. Moderately severe physical damage; *medical* hospitalization and likely intensive care required (e.g., comatose with reflexes intact; third-degree burns less than 20% of body; extensive blood loss but can recover; major fractures). 4. Severe physical damage; *medical* hospitalization with intensive care required (e.g., comatose without reflexes; third-degree burns over 20% of body; extensive blood loss with unstable vital signs; major damage to a vital area). 5. Death	*Enter Code* _____
Potential Lethality: Only Answer if Actual Lethality=0 Likely lethality of actual attempt if no medical damage (the following examples, while having no actual medical damage, had potential for very serious lethality: put gun in mouth and pulled the trigger but gun fails to fire so no medical damage; laying on train tracks with oncoming train but pulled away before run over). 0 = Behavior not likely to result in injury 1 = Behavior likely to result in injury but not likely to cause death 2 = Behavior likely to result in death despite available medical care	*Enter Code* _____

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10.2 HOSPITAL ANXIETY AND DEPRESSION SCALE

Hospital Anxiety and Depression Scale (HADS)

GL assessment
the measure of potential

Name: _____ Date: _____

FOLD HERE

Clinicians are aware that emotions play an important part in most illnesses. If your clinician knows about these feelings he or she will be able to help you more.

This questionnaire is designed to help your clinician to know how you feel. Read each item below and **underline the reply** which comes closest to how you have been feeling in the past week. Ignore the numbers printed at the edge of the questionnaire.

Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response.

FOLD HERE

A	D		A	D
		I feel tense or "wound up"		
3		Most of the time		
2		A lot of the time		
1		From time to time, occasionally		
0		Never		
		I enjoy the things I used to enjoy		
	0	Definitely		
	1	Not quite so much		
	2	Only a little		
	3	Hardly at all		
		I get a sort of frightened feeling as if something awful is about to happen		
3		Very definitely and fairly badly		
2		Yes, but not too badly		
1		Sometimes, but it doesn't worry me		
0		Never		
		I can laugh and see the funny side of things		
	0	As much as I always could		
	1	Not quite so much now		
	2	Definitely not so much now		
	3	Never		
		Worrying thoughts go through my mind		
3		A great deal of the time		
2		A lot of the time		
1		Not too often		
0		Almost never		
		I feel cheerful		
	3	Never		
	2	Not often		
	1	Sometimes		
	0	Most of the time		
		I can sit at ease and feel relaxed		
0		Always		
1		Usually		
2		Not often		
3		Never		
		I feel as if I am slowed down		
		Nearly all the time		3
		Very often		2
		Sometimes		1
		Never		0
		I get a sort of anxious feeling like "butterflies" in the stomach		
		Never	0	
		Occasionally	1	
		Often	2	
		Very often	3	
		I have lost interest in my appearance		
		Definitely		3
		Often I don't take as much care as I should		2
		Sometimes I don't take as much care as I should		1
		I take just as much care as ever		0
		I feel restless as if I have to be on the move		
		Definitely	3	
		Quite a lot	2	
		Not very much	1	
		Never	0	
		I look forward with enjoyment to things		
		As much as I ever have		0
		Somewhat less than I used to		1
		Much less than I used to		2
		Rarely		3
		I get sudden feelings of panic		
		Very often	3	
		Often	2	
		Not very often	1	
		Never	0	
		I can enjoy a good book, radio or television program		
		Often		0
		Sometimes		1
		Not often		2
		Very seldom		3

Please make sure you have answered all the questions.

TOTAL A ☐ D ☐

HADS - USA/English - Version of 15 Apr 08 - Mapi Research Institute.
ID4577

11. DESCRIPTION OF GLOBAL AMENDMENT(S)

This is the original protocol.

11.1 GLOBAL AMENDMENT 1

Date of amendment		23 Sep 2022
EudraCT number **EU number**		2022-002249-16
BI Trial number		1305-0033
BI Investigational Medicinal Product(s)		BI 1015550
Title of protocol		The effect of multiple oral doses of BI 1015550 on metabolism of midazolam administered orally in healthy male subjects (open-label, two-period fixed sequence design trial)
Substantial Global Amendment due to urgent safety reasons		☐
Substantial Global Amendment		☒
Non-substantial Global Amendment		☐
Section to be changed		1. 1.2.1 2. 1.3 3. 2.2.2.1 4. 3.3.2 5. 3.3.3 6. 3.3.4 7. 3.3.5 8. 5.2.3: 1 9. 5.2.6.1.6 10. 7.5: 1 11. 8.1 12. 8.6
Description of change		1. Rationale for twice daily dosing added. 2. Rationale for performing the trial substantiated. 3. Further PK endpoints clarified. 4. Inclusion criteria clarified. 5. Exclusion criteria clarified. 6. Criteria of withdrawal from trial treatment clarified. 7. Trial discontinuation criteria clarified. 8. GFR added to Routine laboratory tests. 9. Causal relationship of AEs clarified.

		10. Confidence intervals clarified. 11. Reference to legally authorized representatives deleted. 12. End of study milestone clarified.
Rationale for change		1-2. Request from the ethics committee 4-8, 10-11. Request from the competent authority 3, 5, 7. Correction of typos and mistakes

APPROVAL / SIGNATURE PAGE

Document Number: c38906736 **Technical Version Number:2.0**

Document Name: clinical-trial-protocol-version-02

Title: The effect of multiple oral doses of BI 1015550 on metabolism of midazolam administered orally in healthy male subjects (open-label, two-period fixed sequence design trial)

Signatures (obtained electronically)

Meaning of Signature	Signed by	Date Signed
Author-Trial Statistician	[redacted]	26 Sep 2022 11:39 CEST
Approval-Clinical Program Leaders		26 Sep 2022 13:42 CEST
Author-Clinical Trial Leader		26 Sep 2022 20:31 CEST
Verification-Paper Signature Completion		27 Sep 2022 09:32 CEST

(Continued) Signatures (obtained electronically)

Meaning of Signature	Signed by	Date Signed