

Statistical Analysis Plan

An Open-label, Randomized, Two-way Crossover, Bioequivalence Study in Healthy Volunteers to Compare the Pharmacokinetics of Two Different Tablets of Sotorasib

SAP Status: Final
SAP Version: 1.0
SAP Date: 15Oct2021

Investigational Medicinal Product: Sotorasib (AMG 510)

Protocol Reference: 20210093
Labcorp Study: 8471128

Sponsor:
Amgen, Inc.
One Amgen Center Drive
Thousand Oaks, California 91320
USA

Study Sites:

Covance Clinical Research Unit
1900 Mason Avenue, Suite 140
Daytona Beach, Florida 32117
USA

Principal Investigators:
[REDACTED], DO
[REDACTED], MD

Covance Dallas Clinical Research Unit
1341 W. Mockingbird Lane, Suite 400E,
Dallas, TX 75247
USA

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TABLE OF CONTENTS

TITLE PAGE	1
TABLE OF CONTENTS	2
LIST OF IN-TEXT TABLES AND FIGURES	3
LIST OF ABBREVIATIONS	4
1. INTRODUCTION	6
2. STUDY OBJECTIVES	6
3. STUDY ENDPOINTS	6
4. STUDY DESIGN	7
5. SAMPLE SIZE JUSTIFICATION	8
6. STUDY TREATMENTS	8
7. DEFINITIONS OF POPULATIONS	10
7.1. All Subjects Population	10
7.2. Safety Population	10
7.3. Pharmacokinetic Population	10
8. STATISTICAL METHODOLOGY	10
8.1. General	10
8.1.1. Handling of Data Quality Issues Due to Coronavirus Disease 2019 and Related Restrictions	11
8.1.2. Calculation of the Summary Statistics	12
8.1.3. Triplicate Readings	12
8.1.4. Repeat and Unscheduled Readings	12
8.2. Subject Disposition and Population Assignment	13
8.3. Screening Demographics and Baseline Characteristics	13
8.4. Prior and Concomitant Medication	13
8.5. Pharmacokinetic Assessments	13
8.5.1. Pharmacokinetic Analysis	13
8.5.2. Presentation of Pharmacokinetic Data	16
8.5.3. Pharmacokinetic Statistical Methodology	16
8.6. Safety and Tolerability Assessments	18
8.6.1. Adverse Events	18
8.6.2. Clinical Laboratory Parameters	20
8.6.3. Vital Signs Parameters	20

8.6.4. 12-lead Electrocardiogram Parameters 20

8.6.5. Other Assessments 20

8.6.6. Safety and Tolerability Statistical Methodology..... 20

9. INTERIM ANALYSES 20

10. SIGNIFICANT CHANGES FROM THE PROTOCOL-SPECIFIED ANALYSES 20

11. REFERENCES 21

12. APPENDICES 22

Appendix 1: Document History..... 22

LIST OF IN-TEXT TABLES AND FIGURES

Figure 1: Study Design 8

LIST OF ABBREVIATIONS

Abbreviations pertain to the statistical analysis plan (SAP) only (not the tables, figures, and listings [TFLs]).

ADaM	Analysis Data Model
AE	adverse event
AUC	area under the concentration-time curve
AUC _{inf}	area under the plasma concentration-time curve from time zero extrapolated to infinity
AUC _{last}	area under the plasma concentration-time curve from time zero to the last quantifiable concentration
BLQ	below the limit of quantification
CDISC	Clinical Data Interchange Standards Consortium
CDER	Center for Drug Evaluation and Research
CI	confidence interval
CTCAE	Common Terminology Criteria for Adverse Events
CL/F	apparent total clearance
C _{max}	maximum observed plasma concentration
COVID-19	coronavirus disease 2019
CRU	clinical research unit
CSR	clinical study report
CTCAE	Common Terminology Criteria for Adverse Events
CV	coefficient of variation
DMP	data management plan
ECG	electrocardiogram
EOS	end of study
eCRF	electronic case report form
GLSM	geometric least square means
ICF	informed consent form
ICH	International Council for/Conference on Harmonisation
λ_z	apparent terminal elimination rate constant
λ_z Lower	start of exponential fit
λ_z N	number of data points included in the log-linear regression
λ_z Span Ratio	time period over which lambda z was determined as a ratio of apparent terminal elimination half-life
λ_z Upper	end of exponential fit
LLOQ	lower limit of quantification
ln	natural log
LSM	least squares mean

MedDRA	Medical Dictionary for Regulatory Activities
NA	not applicable
PK	pharmacokinetic(s)
R ² -adj	adjusted coefficient for determination of exponential fit
SAP	statistical analysis plan
SD	standard deviation
SDV	source document verification
t _{1/2}	apparent terminal elimination half-life
TEAE	treatment-emergent adverse event
TFL	table, figure, and listing
t _{last}	time of the last quantifiable plasma concentration
t _{max}	time of the maximum observed plasma concentration
V _z /F	apparent volume of distribution during the terminal phase
WHODrug	World Health Organization Drug Dictionary

1. INTRODUCTION

This SAP has been developed after review of the clinical study protocol (Final Version 1.0 dated 04 June 2021, Amendment 1 dated 02 September 2021 and Amendment 2 dated 09 September 2021) and electronic case report form (eCRF).

This SAP describes the planned analysis of the pharmacokinetic (PK), safety, and tolerability data from this study. A detailed description of the planned TFLs to be presented in the clinical study report (CSR) is provided in the accompanying TFL shells document.

In general, the analyses are based on information from the protocol, unless they have been modified by agreement with Amgen Inc. A limited amount of information about this study (eg, objectives, study design) is given to help the reader's interpretation.

This SAP must be finalized prior to the lock of the clinical database. Additionally, the SAP and TFL shells should be finalized prior to any programming activities commencing.

This SAP supersedes any statistical considerations identified in the protocol; where considerations are substantially different, they will be so identified. If additional analyses are required to supplement the planned analyses described in this SAP, they may be performed and will be identified accordingly in the CSR. Any substantial deviations from this SAP will be agreed with Amgen Inc. and identified in the CSR.

This SAP is written with consideration of the recommendations outlined in the International Conference on Harmonisation (ICH) E3 guideline *Structure and Content of Clinical Study Reports*, ICH E8 guideline *General Considerations for Clinical Trials*, ICH E9 guideline *Statistical Principles for Clinical Trials*.^{1,2,3}

The document history is presented in [Appendix 1](#).

2. STUDY OBJECTIVES

The primary objective of the study is:

- to compare the PK of 960 mg sotorasib administered orally as 3 x 320 mg tablets (test 1) under fasted condition to 960 mg sotorasib administered orally as 8 x 120 mg tablets (reference) under fasted condition.

The secondary objectives of the study are:

- in 14 subjects, to evaluate the PK of 960 mg sotorasib administered orally as 3 x 320 mg tablets with a high-fat meal (test 2).
- to assess the safety and tolerability of 960 mg sotorasib administered orally as 3 x 320 mg tablets and 960 mg sotorasib administered orally as 8 x 120 mg tablets.

3. STUDY ENDPOINTS

The primary endpoints of the study are sotorasib PK parameters in Period 1 and Period 2:

- maximum observed plasma concentration (C_{max})
- area under the plasma concentration-time curve (AUC) from time zero to the last quantifiable concentration (AUC_{last})
- area under the plasma concentration-time curve from time zero extrapolated to infinity (AUC_{inf}).

The secondary endpoints of the study are:

- adverse events (AE)
- clinical laboratory tests
- 12-lead electrocardiograms (ECGs)
- vital signs
- sotorasib PK parameters in Period 3: C_{max} , AUC_{last} , AUC_{inf} .

4. STUDY DESIGN

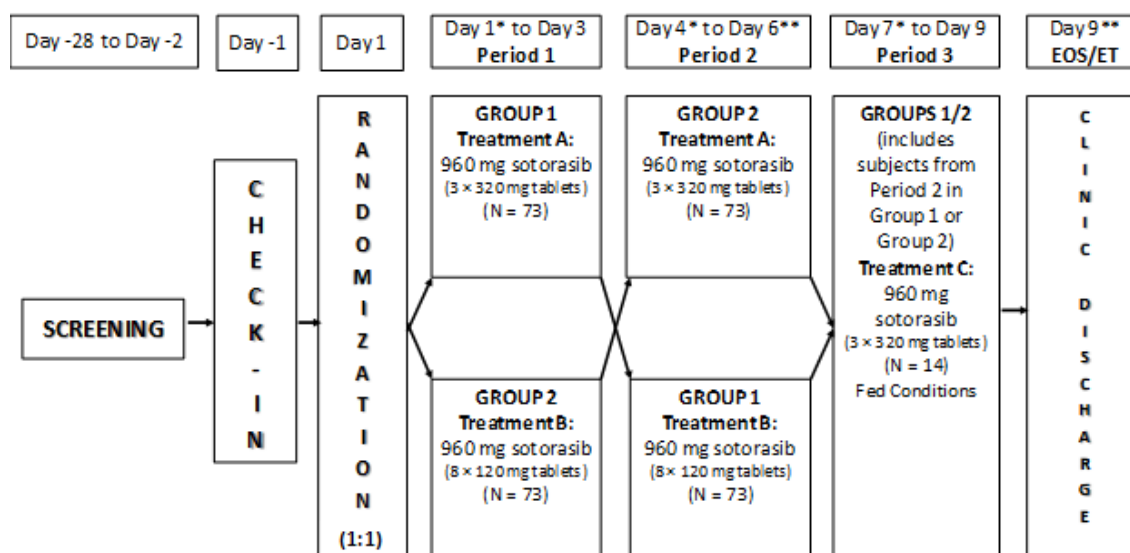
This will be an open-label, multi-center (United States), crossover, 3-period bioequivalence study to compare the PK of a single oral dose of 960 mg sotorasib administered as 3 x 320 mg tablets (test 1) under fasted condition to a single oral dose of 960 mg sotorasib administered as 8 x 120 mg tablets (reference) under fasted condition and the PK of 960 mg sotorasib administered as 3 x 320 mg oral tablets following a high-fat meal (test 2) to 960 mg sotorasib administered as 3 x 320 mg oral tablets under fasted condition (test 1) in healthy male subjects and healthy female subjects. Approximately 146 subjects will be enrolled to ensure that at least 132 subjects complete the study.

Potential subjects will be screened to assess their eligibility to enter the study within 28 days prior to the first dose administration. Subjects will be admitted into the Clinical Research Unit (CRU) on Day -1 and be confined to the CRU until discharge on Day 6 or Day 9. On Day 1, subjects will be randomized to Group 1 or Group 2. Each subject will receive one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets (Treatment A: test 1) and one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets (Treatment B: reference) in either Period 1 or Period 2 according to their assigned group. Each subject will receive both treatments following an overnight fast according to the treatment sequence in Table below. On Day 7, 14 subjects in either Group 1 or Group 2 will proceed to Period 3 and receive one additional administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Treatment C: test 2).

Group	Period 1 (Day 1)	Period 2 (Day 4)	Period 3 (Day 7)
1	Treatment A	Treatment B	Treatment C
2	Treatment B	Treatment A	

An overview of the study design is shown in [Figure 1](#).

Figure 1: Study Design



Abbreviations: EOS = End of Study; ET = Early Termination; N = number of subjects

*Subjects will receive a single dose in each treatment period, on Days 1, 4, and 7.

** Subjects will be discharged on Day 6 or Day 9 according to their treatment assignment.

The total duration of study participation for each subject (from Screening through end of study [EOS]) is anticipated to be approximately 5 weeks.

The start of the study is defined as the date the first enrolled subject signs an Informed Consent Form (ICF). The point of enrollment occurs at the time of subject number allocation. The end of the study is defined as the date of the last subject's last assessment (scheduled or unscheduled).

5. SAMPLE SIZE JUSTIFICATION

The study will require at least 132 subjects completing the study to establish equivalence between the 2 groups with 90% power. This test is based on a 2-sided ratio of means test for a 2 x 2 crossover design for continuous data with significance level 5%. The ratio of means between treatment and control groups under the alternative hypothesis is 0.95. This test assumes lower and upper equivalence limits of 0.8 and 1.25, respectively, and root mean squared error of the log ratio equal to 0.472. Assuming approximately 10% drop out rate, approximately 146 subjects (73 subjects per treatment) will be enrolled in this study.

6. STUDY TREATMENTS

The study treatment names, abbreviations, and ordering to be used in the TFLs are presented in [Table](#).

Table 1: Presentation of Study Treatments in TFLs

Treatments	Abbreviation	Order in TFLs
one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets (Test 1)	Treatment A	1
one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets (Reference)	Treatment B	2
one administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Test 2)	Treatment C	3

The study treatment sequence names, abbreviations, and ordering to be used in the TFLs are presented in [Table 1](#).

Table 1: Presentation of Study Treatment Sequences in TFLs

For all subjects:

Study Treatment Sequence	Abbreviation	Order in TFLs
one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 2 (Day 4)	Sequence AB	1
one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 2 (Day 4)	Sequence BA	2

For the 14 subjects attending all 3 periods:

Study Treatment Sequence	Abbreviation	Order in TFLs
one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 2 (Day 4) and one administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Day 7)	Sequence ABC	1
one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 2 (Day 4) and one administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Day 7)	Sequence BAC	2

The summaries will be based on planned treatment sequences and listings will be based on actual treatment sequences (eg, if subject was assigned to receive placebo in Period 1 and active treatment in Period 2 (sequence [A/B]) but was wrongfully dosed with active treatment in Period 1 and discontinued before start of Period 2, they would be summarized under ‘A/B’ treatment sequence and listed under ‘B’ treatment sequence).

7. DEFINITIONS OF POPULATIONS

Any protocol deviations, including those due to coronavirus disease 2019 (COVID-19) and related restrictions (see [Section 8.1.1](#)), will be considered prior to database lock for their importance and taken into consideration when assigning subjects to populations.

7.1. All Subjects Population

The all subjects population will include all subjects who signed the ICF and had any study assessment recorded in the database per the protocol.

7.2. Safety Population

The safety population will include all subjects who received at least 1 dose of sotorasib and have at least 1 postdose safety assessment.

7.3. Pharmacokinetic Population

The PK population will include all subjects who received at least 1 dose of sotorasib and have evaluable PK data. A subject may be excluded from the PK summary statistics and statistical analysis if the subject has an adverse events of vomiting that occurs at or before 2 times median time to maximum concentration or diarrhea within 24 hours of dosing.

8. STATISTICAL METHODOLOGY

8.1. General

Listings will be provided for all data captured in the database, with the exception of medical history. Listings will include all subjects assigned to the all subjects population and include data up to the point of study completion or discontinuation. Subjects are generally considered to have completed the study if they complete the scheduled end of study visit (rather than early termination visit). Any subject who discontinues the study will be identified accordingly in the listings. Summaries and statistical analyses will include the subjects assigned to the relevant population based on data type.

Data analysis will be performed using the SAS® statistical software package Version 9.4 (or higher if a new version is issued during the study).

Analysis Data Model (ADaM) datasets will be prepared using Clinical Data Interchange Standards Consortium (CDISC) ADaM Version 2.1 (or higher if a new version is issued during the study) and CDISC ADaM Implementation Guide Version 1.1 (or higher if a new version is issued during the study). Pinnacle 21 Enterprise Version 4.2.0 (or higher if a new

version is issued during the study) will be utilized to ensure compliance with CDISC standards.

Caution should be used when interpreting results from the statistical analyses conducted in this study because the sample size is not based on power calculations.

Where reference is made to 'valid' data, this refers to non-missing data which meet the predetermined criteria (eg, are not flagged for exclusion).

Where reference is made to 'all calculations', this includes, but is not limited to, summary statistics, statistical analyses, baseline derivation, changes from baseline, percentage changes from baseline, and any parameter derivations.

All figures will be produced on linear-linear or discrete-linear scales, as applicable, unless specifically stated otherwise.

8.1.1. Handling of Data Quality Issues Due to Coronavirus Disease 2019 and Related Restrictions

Due to COVID-19 and related restrictions, there is a high risk for impact to data integrity, with the recognized potential for:

- Missed visits, caused by, for example:
 - Subject unable to travel to site due to restrictions, the need to quarantine, or COVID-19 infection
 - Subject unwilling to go to site due to fear of COVID-19 infection
 - Site postponing subject's visit due to investigator not being available (eg, if they have been dispatched to hospital handling COVID19 infections)
- Site unable to replenish supply of investigational product
- Incomplete data entry by sites due to limited resources to support study or no access to source documents or to eCRF
- Outstanding source document verification (SDV) due to sponsor or country restrictions on remote SDV, or no or limited access to site(s) for on-site visits
- Unanswered queries

At the time of the reporting of the study results, all protocol deviations due to COVID-19 or related restriction will be assessed for their severity and impact on the analyses. If needed, appropriate statistical methods will be applied as a mitigating action (eg, data might be categorized into 2 analysis groups, with and without COVID-19 and related restrictions impact); however, this will exclude any imputations of the missing values. Any mitigating actions will be agreed with Amgen Inc. in advance and identified in the CSR.

8.1.2. Calculation of the Summary Statistics

For continuous data the following rules will be applied:

- Missing values will not be imputed, unless specifically stated otherwise.
- Unrounded data will be used in the calculation of summary statistics.
- If the number of subjects with valid observations (n) < 3 , summary statistics will not be calculated, with the exception of n , minimum, and maximum.
- In general, as early termination data are not associated with any scheduled timepoint, they will be excluded from all calculations of summary statistics and statistical analyses. Exceptions may be made where justified.

For categorical data the following rules will be applied:

- For ordered categorical data (eg, AE severity), all categories between the possible minimum and maximum categories will be included, even if $n = 0$ for a given category.
- For non-ordered categorical data (eg, race), only those categories for which there is at least 1 subject represented will be included; unless specifically stated otherwise.
- Missing values will not be imputed, unless specifically stated otherwise. A 'missing' category will be included for any parameter for which information is missing. This will ensure that the population size totals are consistent across different parameters.

8.1.3. Triplicate Readings

For 12-lead electrocardiogram (ECG) data only, where triplicate readings are taken, the mean of triplicate readings will replace the separate individual triplicate readings in all calculations.

In case of incomplete triplicate readings (eg, only 2 out of 3 readings were recorded), the mean and/or medians will be calculated, as appropriate, based on the number of readings available.

8.1.4. Repeat and Unscheduled Readings

For vital signs and 12-lead ECG data only, any predose value recorded in addition to the original value or a postdose value recorded within 15 minutes of the original value will be defined as a repeat value; any postdose value recorded more than 15 minutes after the original value will be defined as an unscheduled value. For all other data types (eg, laboratory parameters), any value recorded in addition to the original value will be defined as an unscheduled value.

The original value will be replaced by the last associated repeat value in all calculations.

As unscheduled values are not associated with any scheduled timepoint, they will be excluded from all calculations.

8.2. Subject Disposition and Population Assignment

Subject disposition and population assignment will be listed.

A summary table by treatment will be provided, based on the safety population.

8.3. Screening Demographics and Baseline Characteristics

The screening demographics and baseline characteristics including sex, age, race, ethnicity, height, body weight, and body mass index will be listed.

A summary table by treatment will be provided, based on the safety population.

8.4. Prior and Concomitant Medication

Prior medication will be defined as medication that ends prior to dosing. Concomitant medication will be defined as medication that starts during or after dosing or starts but does not end prior to dosing.

Prior and concomitant medications will be coded using the World Health Organization Drug Dictionary (WHODrug) Global, Format B3, Version September 2020 (or later if a new version is issued during the study; see the data management plan [DMP] for more details). Prior and concomitant medications will be listed.

8.5. Pharmacokinetic Assessments

8.5.1. Pharmacokinetic Analysis

The following PK parameters will be determined on Day 1, Day 4, and Day 7, data permitting, from plasma concentrations of sotorasib using noncompartmental methods in a validated installation of Phoenix WinNonlin (Certara, Version 8.1 or higher):

Parameter	Units ^a	Definition
AUC _{last}	h*ng/mL	area under the plasma concentration-time curve from time zero to the last quantifiable concentration ^b
AUC _{inf}	h*ng/mL	area under the plasma concentration-time curve from time zero extrapolated to infinity ^c
C _{max}	ng/mL	maximum observed plasma concentration
t _{max}	h	time of the maximum observed plasma concentration
t _{last}	h	time of the last quantifiable plasma concentration
t _{1/2}	h	apparent terminal elimination half-life
CL/F	L/h	apparent total clearance
V _z /F	L	apparent volume of distribution during the terminal phase

^a Units are based on concentration units (provided by the bioanalytical lab or preferred units for presentation of PK parameters) and dose units used in the study.

^b The AUC will be calculated using the linear trapezoidal rule.

^c Based on the last observed quantifiable concentration

Additional PK parameters may be determined where appropriate.

Pharmacokinetic analysis will be carried out where possible using actual dose administered (mg) and actual postdose blood sampling times. If an actual time is missing, nominal times may be used with sponsor's approval.

The parameters C_{\max} , t_{last} , and t_{\max} will be obtained directly from the concentration-time profiles.

For multiple peaks, the highest postdose concentration will be reported as C_{\max} . In the case that multiple peaks are of equal magnitude, the earliest t_{\max} will be reported.

8.5.1.1. Criteria for the Calculation of Apparent Terminal Elimination Rate Constant and Half-life

The start of the terminal elimination phase for each subject will be defined by visual inspection and generally will be the first point at which there is no systematic deviation from the log-linear decline in concentrations.

The apparent terminal elimination rate constant (λ_z) will only be calculated when a reliable estimate can be obtained using at least 3 data points, preferably not including C_{\max} , and the adjusted coefficient for determination of exponential fit (R^2 -adj) of the regression line is ≥ 0.8 . Parameters requiring λ_z for their calculation (eg, AUC_{inf} , $t_{1/2}$, CL/F , and V_z/F) will only be calculated if the R^2 -adj value of the regression line is ≥ 0.8 .

The following regression-related diagnostic PK parameters will be determined, when possible:

Parameter	Units	Definition
%AUC _{extrap}	%	percentage of area under the concentration-time curve due to extrapolation from the last quantifiable concentration to infinity
λ_z	1/h	apparent terminal elimination rate constant
λ_z Upper	h	end of exponential fit
λ_z Lower	h	start of exponential fit
λ_z N	NA	number of data points included in the log-linear regression
λ_z Span Ratio	NA	time period over which λ_z was determined as a ratio of $t_{1/2}$
R^2 -adj	NA	adjusted coefficient for determination of exponential fit

Where possible, the span of time used in the determination of λ_z (ie, the difference between λ_z Upper and λ_z Lower) should be ≥ 2 half-lives. If the λ_z Span Ratio is < 2 , the robustness of the $t_{1/2}$ values will be discussed in the CSR.

8.5.1.2. Criteria for Calculation and Reporting of Area Under the Concentration-time Curve

The minimum requirement for the calculation of AUC will be the inclusion of at least 3 consecutive concentrations above the lower limit of quantification (LLOQ). If there are only 3 consecutive concentrations, at least 1 should follow C_{\max} .

If the extrapolated area is >20%, AUC_{\inf} (and derived parameters) will be flagged and may be excluded from the summary statistics and statistical analysis at the discretion of the sponsor or pharmacokineticist.

If AUC_{\inf} cannot be determined reliably for all subjects and/or treatments, an alternative AUC measure, such as AUC to a fixed timepoint or AUC_{last} , may be used in the statistical analysis upon sponsor approval.

8.5.1.3. Criteria for Handling Below the Limit of Quantification or Missing Concentrations for Pharmacokinetic Analysis

Plasma concentrations below the limit of quantification (BLQ) will be assigned a value of 0 before the first measurable concentration and thereafter BLQ concentrations will be treated as missing. The following rules apply to the specific situations defined below:

- If an entire concentration-time profile is BLQ, it will be excluded from PK analysis.
- Where 2 or more consecutive concentrations are BLQ at the end of a profile, the profile will be deemed to have terminated and any further quantifiable concentrations will be set to missing for the calculation of the PK parameters, unless they are considered to be a true characteristic of the profile of the drug.
- If a predose plasma concentration is missing, it will be set to 0 by default within Phoenix WinNonlin.

8.5.1.4. Treatment of Outliers in Pharmacokinetic Analysis

If a value is considered to be anomalous due to being inconsistent with the expected PK profile, it may be appropriate to exclude the value from the PK analysis. However, the exclusion of any data must have strong justification and will be documented in the CSR.

Any quantifiable predose concentration value in the first treatment period will be considered anomalous and set to missing for the PK analysis. This will be set to 0 by default in Phoenix WinNonlin.

If the predose concentration is >5% of C_{\max} in the second or third treatment periods, all PK concentration and parameter data will be flagged and reported but excluded from the summary statistics and statistical analysis for that period.

8.5.2. Presentation of Pharmacokinetic Data

If the actual time of sample collection deviates from the nominal time by more than $\pm 10\%$, the plasma concentration will be flagged and excluded from the summary statistics.

Individual concentrations deemed to be anomalous will be flagged in the listings and excluded from the summary statistics.

For plasma concentration data the following rules will apply:

- Values that are BLQ will be set to 0 for the calculation of summary statistics.
- If the embedded BLQ value is considered anomalous within the concentration-time profile, this value will be excluded from the summary statistics.
- Where there is NR, these will be set to missing.
- If there are less than three values in the data series, only the min, max and N will be presented. The other summary statistics will be denoted as not calculated (NC). BLQ is considered a value.
- If the values are BLQ, then the arithmetic mean, arithmetic SD, median, min and max will be presented as zero, 0 and the geometric mean and geometric coefficient of variation (CV%) will be denoted as NC.
- Arithmetic mean or median values that are BLQ will be presented as 0, and the geometric mean and geometric CV% will be denoted as NC.

For PK parameters the following rule will apply:

- For the calculation of summary statistics of PK parameters, all non-reportable and NC values in a data series will be set to missing.
- AUC_{inf} and AUC_{last} will be set to NC if they were calculated using fewer than three concentrations, and/or three concentrations if the last is C_{max} .
- Geometric mean and coefficient of variation will not be calculated for t_{last} or t_{max} .

8.5.3. Pharmacokinetic Statistical Methodology

All PK concentrations and parameters will be listed.

Summary tables, mean (+ standard deviation [SD]) figures, overlaying individual figures, and individual figures by treatment and time postdose will be provided for plasma PK concentrations. All figures will be produced on both linear and semi-logarithmic scales.

Summary tables by treatment will be provided for all PK parameters, with the exception of regression-related PK parameters.

Bioequivalence:

A statistical analysis will be conducted to investigate the bioequivalence of 960 mg sotorasib administered orally as 3 x 320 mg tablets (test 1) to 960 mg sotorasib administered orally as 8 x 120 mg tablets (reference treatment) for AUC_{last} , AUC_{inf} , and C_{max} . Data from the entire study population will be used for this analysis.

The natural log (ln)-transformed⁴ PK parameters will be analyzed using a mixed model.⁵ The model will include treatment, period, and sequence as fixed effect and subject nested within sequence as a random effect.

For AUC_{last} , AUC_{inf} , and C_{max} separately, the least squares mean (LSM) for each treatment, difference in LSMs between the test 1 and reference treatments, and corresponding 90% confidence interval (CI) will be calculated; these values will then be backtransformed to give the geometric least square mean (GLSM), ratio of GLSMs, and corresponding 90% CI.

Additionally, the pooled estimate (across all treatments) of the within-subject CV will be calculated, and residual plots will be produced to assess the adequacy of the model(s) fitted.

It will be concluded that the test treatment is bioequivalent to the reference treatment if, for C_{max} and AUCs, the 90% CI for the ratio of GLSMs is completely contained within the predefined interval of (0.8000, 1.2500).⁶ This procedure is equivalent to Schuirmann's⁷ two one-sided tests at the 0.05 level of significance.

Examples of the SAS code that will be used are as follows:

Mixed Model Analysis

```
proc mixed data = <data in>;  
  by parcatln parcatl pkday paramn param;  
  class trtan aperiod trtseqp usubjid;  
  model lpk = trtan aperiod trtseqp / cl residual ddfm = kr;  
  lsmeans trtan / cl pdiff = control('2') alpha = 0.1;  
  random intercept / subject = usubjid(trtseqp);  
  ods output lsmeans = <data out>;  
  ods output diffs = <data out>;  
  ods output covparms = <data out>;  
run;
```

Food Effect:

A statistical analysis will be conducted to investigate the food effect for 960 mg sotorasib administered orally as 3 x 320 mg tablets under fed condition (test 2) to 960 mg sotorasib administered orally as 3 x 320 mg tablets under fasted condition (test 1) for AUC_{last} , AUC_{inf} , and C_{max} . Data from 14 subjects who are enrolled in Period 3 will be used for this analysis.

The natural log (ln)-transformed⁴ PK parameters will be analyzed using a mixed model.⁵ The model will include treatment as fixed effect and subject nested within sequence as a random effect.

For AUC_{last} , AUC_{inf} , and C_{max} separately, the least squares mean (LSM) for each treatment, difference in LSMs between the test 1 and test 2, and corresponding 90% confidence interval (CI) will be calculated; these values will then be backtransformed to give the geometric least square mean (GLSM), ratio of GLSMs, and corresponding 90% CI.

Additionally, the pooled estimate (across all treatments) of the within-subject CV will be calculated, and residual plots will be produced to assess the adequacy of the model(s) fitted.

Examples of the SAS code that will be used are as follows:

Mixed Model Analysis

```
proc mixed data = <data in>;  
  by parcatln parcatl pkday paramn param;  
  class trtan usubjid;  
  model lpk = trtan / cl residual ddfm = kr;  
  lsmeans trtan / cl pdiff = control('2') alpha = 0.1;  
  random intercept / subject = usubjid(trtseqp);  
  ods output lsmeans = <data out>;  
  ods output diffs = <data out>;  
  ods output covparms = <data out>;  
run;
```

8.6. Safety and Tolerability Assessments

8.6.1. Adverse Events

All AEs will be coded using the Medical Dictionary for Regulatory Activities (MedDRA) Version 24.0 (or higher if a new version is issued during the study; see the DMP for more details). All AEs will be assigned a severity grade using Common Terminology Criteria for Adverse Events (CTCAE) Version 5.0 (or higher if a new version is issued during the study; see the protocol for more details).

A treatment-emergent adverse event (TEAE) will be defined as an AE that starts during or after dosing, or starts prior to dosing and increases in severity after dosing within each period.

A treatment-related TEAE will be defined as a TEAE with a relationship related to the study treatment, as determined by the investigator.

All AEs will be listed. In addition to the data recorded in the database, the listings will include derived onset time and duration. Onset time will be calculated from the time of dosing for TEAEs only.

The frequency of subjects with TEAEs and the number of TEAEs will be summarized for the following categories:

- TEAEs (overall, serious, leading to discontinuation, and leading to death) by treatment
- TEAEs by severity and treatment

- Treatment-related TEAEs (overall, serious, leading to discontinuation, and leading to death) by treatment
- Treatment-related TEAEs by severity and treatment

The frequency of subjects will be summarized separately for TEAEs and treatment-related TEAEs by the following:

- System organ class, preferred term, and treatment
- Preferred term and treatment

For the AE data the following rules will apply:

- For the derivation of treatment-emergent status (applicable to all AEs): If the start date/time of an AE is incomplete or missing, an AE will be assumed to not be a TEAE, unless the incomplete start date/time or the end date/time indicates an AE started after dosing.
- For the derivation of treatment-related status (applicable to TEAEs only): If the study treatment relationship for a TEAE is missing, a TEAE will be assumed to not be a treatment-related TEAE.
- For the derivation of onset time (applicable to TEAEs only): If the start date/time of a TEAE is missing, onset time will not be calculated. If the start date/time of a TEAE is incomplete, where possible, the minimum possible onset time will be calculated and presented in '≥DD:HH:MM' format (eg, if the date/time of dosing is 01MAY2019/08:00 and recorded start date/time of a TEAE is 03MAY2019, then the minimum possible onset time will be calculated by assuming a TEAE started at the first hour and minute of 03MAY2019 [03MAY2019/00:00], thus will be presented as onset time ≥01:16:00 in the listing). If the start date of a TEAE is the same as the date of dosing but the start time of a TEAE is missing, an onset time will be presented as '≥00:00:01'. Any clock changes will be accounted for in the derivation.
- For the derivation of duration (applicable to all AEs): If the end date/time of an AE is missing, duration will not be calculated. If the start or end date/time of an AE is incomplete, where possible, the maximum possible duration will be calculated and presented in '≤DD:HH:MM' format (eg, if the start of an AE date/time is 01MAY2019/08:00 and its recorded end date/time is 03MAY2019, then the maximum possible duration will be calculated by assuming an AE ended at the last hour and minute of 03MAY2019 [03MAY2019/23:59], thus will be presented as duration ≤02:15:59 in the listing). Any clock changes will be accounted for in the derivation.
- For the calculation of TEAE summary statistics: If the severity of a TEAE is missing, that TEAE will be counted under the 'missing' category.

- For the calculation of TEAE summary statistics: If a subject experienced multiple TEAEs with the same preferred term for the same treatment, this will be counted as 1 TEAE for that treatment under the maximum severity recorded.

8.6.2. Clinical Laboratory Parameters

All clinical laboratory parameters, will be listed, as applicable; any value outside the clinical reference range will be flagged. Separate listings will be provided for any parameter for which there is any individual subject value outside the respective clinical reference range.

Summary tables by treatment and timepoint will be provided for clinical chemistry and hematology parameters.

Values recorded as $<x$, $\leq x$, $>x$, or $\geq x$ will be displayed in the listings as recorded. For the derivation of listing flags, all calculations, and presentation in the figures, $<x$ and $\leq x$ values will be set to 0, whereas $>x$ and $\geq x$ values will be set to x .

8.6.3. Vital Signs Parameters

All vital signs parameters, will be listed, as applicable; any value outside the clinical reference range will be flagged.

Summary tables by treatment and timepoint will be provided by treatment group for all vital signs parameters as applicable.

8.6.4. 12-lead Electrocardiogram Parameters

All 12-lead ECG parameters will be listed; any value outside the clinical reference range will be flagged.

Summary tables by treatment and timepoint will be provided for all 12-lead ECG parameters.

8.6.5. Other Assessments

Medical history will not be listed.

All other safety and tolerability assessments not detailed in the above sections will be listed only.

8.6.6. Safety and Tolerability Statistical Methodology

No inferential statistical analyses are planned.

9. INTERIM ANALYSES

No interim analyses are planned.

10. SIGNIFICANT CHANGES FROM THE PROTOCOL-SPECIFIED ANALYSES

There were no significant changes from the protocol-specified analyses.

11. REFERENCES

1. ICH. ICH Harmonised Tripartite Guideline: Structure and content of clinical study reports (E3). 30 November 1995.
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6. Statistical Approaches to Establishing Bioequivalence. Rockville, MD: US Dept of Health and Human Services, Food and Drug Administration, Center for Drug Evaluation and Research (CDER); January 2001.
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12. APPENDICES

Appendix 1: Document History

Status and Version	Date of Change	Summary/Reason for Changes
Final Version 1.0	NA	NA; the first version.

NA = not applicable



Statistical Analysis Plan (SAP) Approval Form

Type of Approval (select one) : ☒ SAP

Sponsor Name:	Amgen, Inc.		
Sponsor Protocol/CIP ID:	20210093	Covance Study ID:	8471128
SAP text filename:	Amgen510_20210093_SAP_Final_15 Oct2021.pdf	TFL shells filename:	Amgen510_20210093_TFL_Final_15 Oct2021.pdf
Version:	1	Date:	15Oct2021

Covance Approval(s):

Lead Statistician



Approval Signature Print Name Job Title Date	  Biostatistician I approved this document 20 Oct 2021 5:21 PM -05:00
---	---

Sponsor Approval(s):

By signing below when the statistical analysis plan (SAP) is considered final, the signatories agree to the analyses to be performed for this study and to the format of the associated tables, figures, and listings (TFLs). Once the SAP has been signed, programming of the Analysis Dataset Model (ADaM) datasets and TFLs based on these documents can proceed. Any modifications to the SAP text and TFL shells made after signing may result in a work-scope change.

Approval Signature Print Name Job Title Date	  Biostatist 20Oct2021
---	--

Please scan/email completed form(s) to the Lead Statistician listed below:

Printed Name/Title:	 , Biostatistician
Email:	

Statistical Analysis Plan

An Open-label, Randomized, Two-way Crossover, Bioequivalence Study in Healthy Volunteers to Compare the Pharmacokinetics of Two Different Tablets of Sotorasib

SAP Status: Final
SAP Version: 1.0
SAP Date: 15Oct2021

Investigational Medicinal Product: Sotorasib (AMG 510)

Protocol Reference: 20210093
Labcorp Study: 8471128

Sponsor:
Amgen, Inc.
One Amgen Center Drive
Thousand Oaks, California 91320
USA

Study Sites:

Covance Clinical Research Unit
1900 Mason Avenue, Suite 140
Daytona Beach, Florida 32117
USA

Principal Investigators:
[REDACTED], DO
[REDACTED] MD

Covance Dallas Clinical Research Unit
1341 W. Mockingbird Lane, Suite 400E,
Dallas, TX 75247
USA

Information described herein is confidential and may be disclosed only with the express written permission of the sponsor.

TABLE OF CONTENTS

TITLE PAGE	1
TABLE OF CONTENTS	2
LIST OF IN-TEXT TABLES AND FIGURES	3
LIST OF ABBREVIATIONS	4
1. INTRODUCTION	6
2. STUDY OBJECTIVES	6
3. STUDY ENDPOINTS	6
4. STUDY DESIGN	7
5. SAMPLE SIZE JUSTIFICATION	8
6. STUDY TREATMENTS	8
7. DEFINITIONS OF POPULATIONS	10
7.1. All Subjects Population	10
7.2. Safety Population	10
7.3. Pharmacokinetic Population	10
8. STATISTICAL METHODOLOGY	10
8.1. General	10
8.1.1. Handling of Data Quality Issues Due to Coronavirus Disease 2019 and Related Restrictions	11
8.1.2. Calculation of the Summary Statistics	12
8.1.3. Triplicate Readings	12
8.1.4. Repeat and Unscheduled Readings	12
8.2. Subject Disposition and Population Assignment	13
8.3. Screening Demographics and Baseline Characteristics	13
8.4. Prior and Concomitant Medication	13
8.5. Pharmacokinetic Assessments	13
8.5.1. Pharmacokinetic Analysis	13
8.5.2. Presentation of Pharmacokinetic Data	16
8.5.3. Pharmacokinetic Statistical Methodology	16
8.6. Safety and Tolerability Assessments	18
8.6.1. Adverse Events	18
8.6.2. Clinical Laboratory Parameters	20
8.6.3. Vital Signs Parameters	20

8.6.4. 12-lead Electrocardiogram Parameters20

8.6.5. Other Assessments20

8.6.6. Safety and Tolerability Statistical Methodology20

9. INTERIM ANALYSES20

10. SIGNIFICANT CHANGES FROM THE PROTOCOL-SPECIFIED ANALYSES20

11. REFERENCES21

12. APPENDICES.....22

Appendix 1: Document History.....22

LIST OF IN-TEXT TABLES AND FIGURES

Figure 1: Study Design 8

LIST OF ABBREVIATIONS

Abbreviations pertain to the statistical analysis plan (SAP) only (not the tables, figures, and listings [TFLs]).

ADaM	Analysis Data Model
AE	adverse event
AUC	area under the concentration-time curve
AUC _{inf}	area under the plasma concentration-time curve from time zero extrapolated to infinity
AUC _{last}	area under the plasma concentration-time curve from time zero to the last quantifiable concentration
BLQ	below the limit of quantification
CDISC	Clinical Data Interchange Standards Consortium
CDER	Center for Drug Evaluation and Research
CI	confidence interval
CTCAE	Common Terminology Criteria for Adverse Events
CL/F	apparent total clearance
C _{max}	maximum observed plasma concentration
COVID-19	coronavirus disease 2019
CRU	clinical research unit
CSR	clinical study report
CTCAE	Common Terminology Criteria for Adverse Events
CV	coefficient of variation
DMP	data management plan
ECG	electrocardiogram
EOS	end of study
eCRF	electronic case report form
GLSM	geometric least square means
ICF	informed consent form
ICH	International Council for/Conference on Harmonisation
λ_z	apparent terminal elimination rate constant
λ_z Lower	start of exponential fit
λ_z N	number of data points included in the log-linear regression
λ_z Span Ratio	time period over which λ_z was determined as a ratio of apparent terminal elimination half-life
λ_z Upper	end of exponential fit
LLOQ	lower limit of quantification
ln	natural log
LSM	least squares mean

MedDRA	Medical Dictionary for Regulatory Activities
NA	not applicable
PK	pharmacokinetic(s)
R ² -adj	adjusted coefficient for determination of exponential fit
SAP	statistical analysis plan
SD	standard deviation
SDV	source document verification
t _{1/2}	apparent terminal elimination half-life
TEAE	treatment-emergent adverse event
TFL	table, figure, and listing
t _{last}	time of the last quantifiable plasma concentration
t _{max}	time of the maximum observed plasma concentration
V _z /F	apparent volume of distribution during the terminal phase
WHODrug	World Health Organization Drug Dictionary

1. INTRODUCTION

This SAP has been developed after review of the clinical study protocol (Final Version 1.0 dated 04 June 2021, Amendment 1 dated 02 September 2021 and Amendment 2 dated 09 September 2021) and electronic case report form (eCRF).

This SAP describes the planned analysis of the pharmacokinetic (PK), safety, and tolerability data from this study. A detailed description of the planned TFLs to be presented in the clinical study report (CSR) is provided in the accompanying TFL shells document.

In general, the analyses are based on information from the protocol, unless they have been modified by agreement with Amgen Inc. A limited amount of information about this study (eg, objectives, study design) is given to help the reader's interpretation.

This SAP must be finalized prior to the lock of the clinical database. Additionally, the SAP and TFL shells should be finalized prior to any programming activities commencing.

This SAP supersedes any statistical considerations identified in the protocol; where considerations are substantially different, they will be so identified. If additional analyses are required to supplement the planned analyses described in this SAP, they may be performed and will be identified accordingly in the CSR. Any substantial deviations from this SAP will be agreed with Amgen Inc. and identified in the CSR.

This SAP is written with consideration of the recommendations outlined in the International Conference on Harmonisation (ICH) E3 guideline *Structure and Content of Clinical Study Reports*, ICH E8 guideline *General Considerations for Clinical Trials*, ICH E9 guideline *Statistical Principles for Clinical Trials*.^{1,2,3}

The document history is presented in [Appendix 1](#).

2. STUDY OBJECTIVES

The primary objective of the study is:

- to compare the PK of 960 mg sotorasib administered orally as 3 x 320 mg tablets (test 1) under fasted condition to 960 mg sotorasib administered orally as 8 x 120 mg tablets (reference) under fasted condition.

The secondary objectives of the study are:

- in 14 subjects, to evaluate the PK of 960 mg sotorasib administered orally as 3 x 320 mg tablets with a high-fat meal (test 2).
- to assess the safety and tolerability of 960 mg sotorasib administered orally as 3 x 320 mg tablets and 960 mg sotorasib administered orally as 8 x 120 mg tablets.

3. STUDY ENDPOINTS

The primary endpoints of the study are sotorasib PK parameters in Period 1 and Period 2:

- maximum observed plasma concentration (C_{max})
- area under the plasma concentration-time curve (AUC) from time zero to the last quantifiable concentration (AUC_{last})
- area under the plasma concentration-time curve from time zero extrapolated to infinity (AUC_{inf}).

The secondary endpoints of the study are:

- adverse events (AE)
- clinical laboratory tests
- 12-lead electrocardiograms (ECGs)
- vital signs
- sotorasib PK parameters in Period 3: C_{max} , AUC_{last} , AUC_{inf}

4. STUDY DESIGN

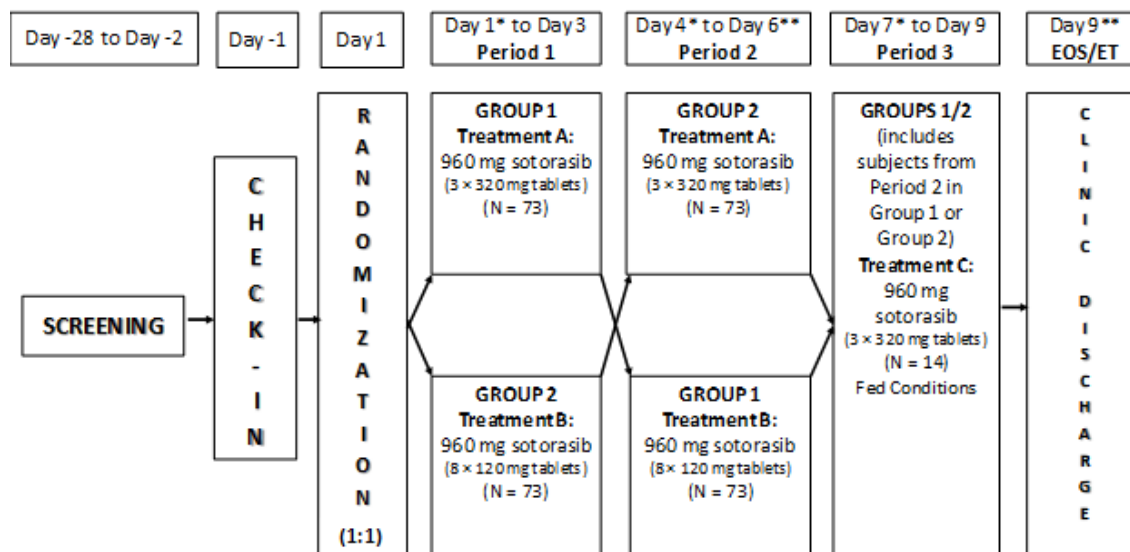
This will be an open-label, multi-center (United States), crossover, 3-period bioequivalence study to compare the PK of a single oral dose of 960 mg sotorasib administered as 3 x 320 mg tablets (test 1) under fasted condition to a single oral dose of 960 mg sotorasib administered as 8 x 120 mg tablets (reference) under fasted condition and the PK of 960 mg sotorasib administered as 3 x 320 mg oral tablets following a high-fat meal (test 2) to 960 mg sotorasib administered as 3 x 320 mg oral tablets under fasted condition (test 1) in healthy male subjects and healthy female subjects. Approximately 146 subjects will be enrolled to ensure that at least 132 subjects complete the study.

Potential subjects will be screened to assess their eligibility to enter the study within 28 days prior to the first dose administration. Subjects will be admitted into the Clinical Research Unit (CRU) on Day -1 and be confined to the CRU until discharge on Day 6 or Day 9. On Day 1, subjects will be randomized to Group 1 or Group 2. Each subject will receive one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets (Treatment A: test 1) and one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets (Treatment B: reference) in either Period 1 or Period 2 according to their assigned group. Each subject will receive both treatments following an overnight fast according to the treatment sequence in Table below. On Day 7, 14 subjects in either Group 1 or Group 2 will proceed to Period 3 and receive one additional administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Treatment C: test 2).

Group	Period 1 (Day 1)	Period 2 (Day 4)	Period 3 (Day 7)
1	Treatment A	Treatment B	Treatment C
2	Treatment B	Treatment A	

An overview of the study design is shown in Figure 1.

Figure 1: Study Design



Abbreviations: EOS = End of Study; ET = Early Termination; N = number of subjects

*Subjects will receive a single dose in each treatment period, on Days 1, 4, and 7.

** Subjects will be discharged on Day 6 or Day 9 according to their treatment assignment.

The total duration of study participation for each subject (from Screening through end of study [EOS]) is anticipated to be approximately 5 weeks.

The start of the study is defined as the date the first enrolled subject signs an Informed Consent Form (ICF). The point of enrollment occurs at the time of subject number allocation. The end of the study is defined as the date of the last subject's last assessment (scheduled or unscheduled).

5. SAMPLE SIZE JUSTIFICATION

The study will require at least 132 subjects completing the study to establish equivalence between the 2 groups with 90% power. This test is based on a 2-sided ratio of means test for a 2 x 2 crossover design for continuous data with significance level 5%. The ratio of means between treatment and control groups under the alternative hypothesis is 0.95. This test assumes lower and upper equivalence limits of 0.8 and 1.25, respectively, and root mean squared error of the log ratio equal to 0.472. Assuming approximately 10% drop out rate, approximately 146 subjects (73 subjects per treatment) will be enrolled in this study.

6. STUDY TREATMENTS

The study treatment names, abbreviations, and ordering to be used in the TFLs are presented in [Table](#).

Table 1: Presentation of Study Treatments in TFLs

Treatments	Abbreviation	Order in TFLs
one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets (Test 1)	Treatment A	1
one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets (Reference)	Treatment B	2
one administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Test 2)	Treatment C	3

The study treatment sequence names, abbreviations, and ordering to be used in the TFLs are presented in [Table 1](#).

Table 1: Presentation of Study Treatment Sequences in TFLs

For all subjects:

Study Treatment Sequence	Abbreviation	Order in TFLs
one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 2 (Day 4)	Sequence AB	1
one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 2 (Day 4)	Sequence BA	2

For the 14 subjects attending all 3 periods:

Study Treatment Sequence	Abbreviation	Order in TFLs
one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 2 (Day 4) and one administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Day 7)	Sequence ABC	1
one administration of 960 mg sotorasib administered orally as 8 x 120 mg tablets on Period 1 (Day 1) and one administration of 960 mg sotorasib administered orally as 3 x 320 mg tablets on Period 2 (Day 4) and one administration of 960 mg sotorasib administered orally as 3x 320 mg tablets with a high-fat meal (Day 7)	Sequence BAC	2

The summaries will be based on planned treatment sequences and listings will be based on actual treatment sequences (eg, if subject was assigned to receive placebo in Period 1 and active treatment in Period 2 (sequence [A/B]) but was wrongfully dosed with active treatment in Period 1 and discontinued before start of Period 2, they would be summarized under 'A/B' treatment sequence and listed under 'B' treatment sequence).

7. DEFINITIONS OF POPULATIONS

Any protocol deviations, including those due to coronavirus disease 2019 (COVID-19) and related restrictions (see [Section 8.1.1](#)), will be considered prior to database lock for their importance and taken into consideration when assigning subjects to populations.

7.1. All Subjects Population

The all subjects population will include all subjects who signed the ICF and had any study assessment recorded in the database per the protocol.

7.2. Safety Population

The safety population will include all subjects who received at least 1 dose of sotorasib and have at least 1 postdose safety assessment.

7.3. Pharmacokinetic Population

The PK population will include all subjects who received at least 1 dose of sotorasib and have evaluable PK data. A subject may be excluded from the PK summary statistics and statistical analysis if the subject has an adverse events of vomiting that occurs at or before 2 times median time to maximum concentration or diarrhea within 24 hours of dosing.

8. STATISTICAL METHODOLOGY

8.1. General

Listings will be provided for all data captured in the database, with the exception of medical history. Listings will include all subjects assigned to the all subjects population and include data up to the point of study completion or discontinuation. Subjects are generally considered to have completed the study if they complete the scheduled end of study visit (rather than early termination visit). Any subject who discontinues the study will be identified accordingly in the listings. Summaries and statistical analyses will include the subjects assigned to the relevant population based on data type.

Data analysis will be performed using the SAS® statistical software package Version 9.4 (or higher if a new version is issued during the study).

Analysis Data Model (ADaM) datasets will be prepared using Clinical Data Interchange Standards Consortium (CDISC) ADaM Version 2.1 (or higher if a new version is issued during the study) and CDISC ADaM Implementation Guide Version 1.1 (or higher if a new version is issued during the study). Pinnacle 21 Enterprise Version 4.2.0 (or higher if a new

version is issued during the study) will be utilized to ensure compliance with CDISC standards.

Caution should be used when interpreting results from the statistical analyses conducted in this study because the sample size is not based on power calculations.

Where reference is made to 'valid' data, this refers to non-missing data which meet the predetermined criteria (eg, are not flagged for exclusion).

Where reference is made to 'all calculations', this includes, but is not limited to, summary statistics, statistical analyses, baseline derivation, changes from baseline, percentage changes from baseline, and any parameter derivations.

All figures will be produced on linear-linear or discrete-linear scales, as applicable, unless specifically stated otherwise.

8.1.1. Handling of Data Quality Issues Due to Coronavirus Disease 2019 and Related Restrictions

Due to COVID-19 and related restrictions, there is a high risk for impact to data integrity, with the recognized potential for:

- Missed visits, caused by, for example:
 - Subject unable to travel to site due to restrictions, the need to quarantine, or COVID-19 infection
 - Subject unwilling to go to site due to fear of COVID-19 infection
 - Site postponing subject's visit due to investigator not being available (eg, if they have been dispatched to hospital handling COVID19 infections)
- Site unable to replenish supply of investigational product
- Incomplete data entry by sites due to limited resources to support study or no access to source documents or to eCRF
- Outstanding source document verification (SDV) due to sponsor or country restrictions on remote SDV, or no or limited access to site(s) for on-site visits
- Unanswered queries

At the time of the reporting of the study results, all protocol deviations due to COVID-19 or related restriction will be assessed for their severity and impact on the analyses. If needed, appropriate statistical methods will be applied as a mitigating action (eg, data might be categorized into 2 analysis groups, with and without COVID-19 and related restrictions impact); however, this will exclude any imputations of the missing values. Any mitigating actions will be agreed with Amgen Inc. in advance and identified in the CSR.

8.1.2. Calculation of the Summary Statistics

For continuous data the following rules will be applied:

- Missing values will not be imputed, unless specifically stated otherwise.
- Unrounded data will be used in the calculation of summary statistics.
- If the number of subjects with valid observations (n) < 3 , summary statistics will not be calculated, with the exception of n , minimum, and maximum.
- In general, as early termination data are not associated with any scheduled timepoint, they will be excluded from all calculations of summary statistics and statistical analyses. Exceptions may be made where justified.

For categorical data the following rules will be applied:

- For ordered categorical data (eg, AE severity), all categories between the possible minimum and maximum categories will be included, even if $n = 0$ for a given category.
- For non-ordered categorical data (eg, race), only those categories for which there is at least 1 subject represented will be included; unless specifically stated otherwise.
- Missing values will not be imputed, unless specifically stated otherwise. A 'missing' category will be included for any parameter for which information is missing. This will ensure that the population size totals are consistent across different parameters.

8.1.3. Triplicate Readings

For 12-lead electrocardiogram (ECG) data only, where triplicate readings are taken, the mean of triplicate readings will replace the separate individual triplicate readings in all calculations.

In case of incomplete triplicate readings (eg, only 2 out of 3 readings were recorded), the mean and/or medians will be calculated, as appropriate, based on the number of readings available.

8.1.4. Repeat and Unscheduled Readings

For vital signs and 12-lead ECG data only, any predose value recorded in addition to the original value or a postdose value recorded within 15 minutes of the original value will be defined as a repeat value; any postdose value recorded more than 15 minutes after the original value will be defined as an unscheduled value. For all other data types (eg, laboratory parameters), any value recorded in addition to the original value will be defined as an unscheduled value.

The original value will be replaced by the last associated repeat value in all calculations.

As unscheduled values are not associated with any scheduled timepoint, they will be excluded from all calculations.

8.2. Subject Disposition and Population Assignment

Subject disposition and population assignment will be listed.

A summary table by treatment will be provided, based on the safety population.

8.3. Screening Demographics and Baseline Characteristics

The screening demographics and baseline characteristics including sex, age, race, ethnicity, height, body weight, and body mass index will be listed.

A summary table by treatment will be provided, based on the safety population.

8.4. Prior and Concomitant Medication

Prior medication will be defined as medication that ends prior to dosing. Concomitant medication will be defined as medication that starts during or after dosing or starts but does not end prior to dosing.

Prior and concomitant medications will be coded using the World Health Organization Drug Dictionary (WHODrug) Global, Format B3, Version September 2020 (or later if a new version is issued during the study; see the data management plan [DMP] for more details). Prior and concomitant medications will be listed.

8.5. Pharmacokinetic Assessments

8.5.1. Pharmacokinetic Analysis

The following PK parameters will be determined on Day 1, Day 4, and Day 7, data permitting, from plasma concentrations of sotorasib using noncompartmental methods in a validated installation of Phoenix WinNonlin (Certara, Version 8.1 or higher):

Parameter	Units ^a	Definition
AUC _{last}	h*ng/mL	area under the plasma concentration-time curve from time zero to the last quantifiable concentration ^b
AUC _{inf}	h*ng/mL	area under the plasma concentration-time curve from time zero extrapolated to infinity ^c
C _{max}	ng/mL	maximum observed plasma concentration
t _{max}	h	time of the maximum observed plasma concentration
t _{last}	h	time of the last quantifiable plasma concentration
t _{1/2}	h	apparent terminal elimination half-life
CL/F	L/h	apparent total clearance
V _z /F	L	apparent volume of distribution during the terminal phase

^a Units are based on concentration units (provided by the bioanalytical lab or preferred units for presentation of PK parameters) and dose units used in the study.

^b The AUC will be calculated using the linear trapezoidal rule.

^c Based on the last observed quantifiable concentration

Additional PK parameters may be determined where appropriate.

Pharmacokinetic analysis will be carried out where possible using actual dose administered (mg) and actual postdose blood sampling times. If an actual time is missing, nominal times may be used with sponsor's approval.

The parameters C_{\max} , t_{last} , and t_{\max} will be obtained directly from the concentration-time profiles.

For multiple peaks, the highest postdose concentration will be reported as C_{\max} . In the case that multiple peaks are of equal magnitude, the earliest t_{\max} will be reported.

8.5.1.1. Criteria for the Calculation of Apparent Terminal Elimination Rate Constant and Half-life

The start of the terminal elimination phase for each subject will be defined by visual inspection and generally will be the first point at which there is no systematic deviation from the log-linear decline in concentrations.

The apparent terminal elimination rate constant (λ_z) will only be calculated when a reliable estimate can be obtained using at least 3 data points, preferably not including C_{\max} , and the adjusted coefficient for determination of exponential fit (R^2 -adj) of the regression line is ≥ 0.8 . Parameters requiring λ_z for their calculation (eg, AUC_{inf} , $t_{1/2}$, CL/F , and V_z/F) will only be calculated if the R^2 -adj value of the regression line is ≥ 0.8 .

The following regression-related diagnostic PK parameters will be determined, when possible:

Parameter	Units	Definition
%AUC _{extrap}	%	percentage of area under the concentration-time curve due to extrapolation from the last quantifiable concentration to infinity
λ_z	1/h	apparent terminal elimination rate constant
λ_z Upper	h	end of exponential fit
λ_z Lower	h	start of exponential fit
λ_z N	NA	number of data points included in the log-linear regression
λ_z Span Ratio	NA	time period over which λ_z was determined as a ratio of $t_{1/2}$
R^2 -adj	NA	adjusted coefficient for determination of exponential fit

Where possible, the span of time used in the determination of λ_z (ie, the difference between λ_z Upper and λ_z Lower) should be ≥ 2 half-lives. If the λ_z Span Ratio is < 2 , the robustness of the $t_{1/2}$ values will be discussed in the CSR.

8.5.1.2. Criteria for Calculation and Reporting of Area Under the Concentration-time Curve

The minimum requirement for the calculation of AUC will be the inclusion of at least 3 consecutive concentrations above the lower limit of quantification (LLOQ). If there are only 3 consecutive concentrations, at least 1 should follow C_{\max} .

If the extrapolated area is >20%, AUC_{\inf} (and derived parameters) will be flagged and may be excluded from the summary statistics and statistical analysis at the discretion of the sponsor or pharmacokineticist.

If AUC_{\inf} cannot be determined reliably for all subjects and/or treatments, an alternative AUC measure, such as AUC to a fixed timepoint or AUC_{last} , may be used in the statistical analysis upon sponsor approval.

8.5.1.3. Criteria for Handling Below the Limit of Quantification or Missing Concentrations for Pharmacokinetic Analysis

Plasma concentrations below the limit of quantification (BLQ) will be assigned a value of 0 before the first measurable concentration and thereafter BLQ concentrations will be treated as missing. The following rules apply to the specific situations defined below:

- If an entire concentration-time profile is BLQ, it will be excluded from PK analysis.
- Where 2 or more consecutive concentrations are BLQ at the end of a profile, the profile will be deemed to have terminated and any further quantifiable concentrations will be set to missing for the calculation of the PK parameters, unless they are considered to be a true characteristic of the profile of the drug.
- If a predose plasma concentration is missing, it will be set to 0 by default within Phoenix WinNonlin.

8.5.1.4. Treatment of Outliers in Pharmacokinetic Analysis

If a value is considered to be anomalous due to being inconsistent with the expected PK profile, it may be appropriate to exclude the value from the PK analysis. However, the exclusion of any data must have strong justification and will be documented in the CSR.

Any quantifiable predose concentration value in the first treatment period will be considered anomalous and set to missing for the PK analysis. This will be set to 0 by default in Phoenix WinNonlin.

If the predose concentration is >5% of C_{\max} in the second or third treatment periods, all PK concentration and parameter data will be flagged and reported but excluded from the summary statistics and statistical analysis for that period.

8.5.2. Presentation of Pharmacokinetic Data

If the actual time of sample collection deviates from the nominal time by more than $\pm 10\%$, the plasma concentration will be flagged and excluded from the summary statistics.

Individual concentrations deemed to be anomalous will be flagged in the listings and excluded from the summary statistics.

For plasma concentration data the following rules will apply:

- Values that are BLQ will be set to 0 for the calculation of summary statistics.
- If the embedded BLQ value is considered anomalous within the concentration-time profile, this value will be excluded from the summary statistics.
- Where there is NR, these will be set to missing.
- If there are less than three values in the data series, only the min, max and N will be presented. The other summary statistics will be denoted as not calculated (NC). BLQ is considered a value.
- If the values are BLQ, then the arithmetic mean, arithmetic SD, median, min and max will be presented as zero, 0 and the geometric mean and geometric coefficient of variation (CV%) will be denoted as NC.
- Arithmetic mean or median values that are BLQ will be presented as 0, and the geometric mean and geometric CV% will be denoted as NC.

For PK parameters the following rule will apply:

- For the calculation of summary statistics of PK parameters, all non-reportable and NC values in a data series will be set to missing.
- AUC_{inf} and AUC_{last} will be set to NC if they were calculated using fewer than three concentrations, and/or three concentrations if the last is C_{max} .
- Geometric mean and coefficient of variation will not be calculated for t_{last} or t_{max} .

8.5.3. Pharmacokinetic Statistical Methodology

All PK concentrations and parameters will be listed.

Summary tables, mean (+ standard deviation [SD]) figures, overlaying individual figures, and individual figures by treatment and time postdose will be provided for plasma PK concentrations. All figures will be produced on both linear and semi-logarithmic scales.

Summary tables by treatment will be provided for all PK parameters, with the exception of regression-related PK parameters.

Bioequivalence:

A statistical analysis will be conducted to investigate the bioequivalence of 960 mg sotorasib administered orally as 3 x 320 mg tablets (test 1) to 960 mg sotorasib administered orally as 8 x 120 mg tablets (reference treatment) for AUC_{last} , AUC_{inf} and C_{max} . Data from the entire study population will be used for this analysis.

The natural log (ln)-transformed⁴ PK parameters will be analyzed using a mixed model.⁵ The model will include treatment, period, and sequence as fixed effect and subject nested within sequence as a random effect.

For AUC_{last} , AUC_{inf} and C_{max} separately, the least squares mean (LSM) for each treatment, difference in LSMs between the test 1 and reference treatments, and corresponding 90% confidence interval (CI) will be calculated; these values will then be backtransformed to give the geometric least square mean (GLSM), ratio of GLSMs, and corresponding 90% CI.

Additionally, the pooled estimate (across all treatments) of the within-subject CV will be calculated, and residual plots will be produced to assess the adequacy of the model(s) fitted.

It will be concluded that the test treatment is bioequivalent to the reference treatment if, for C_{max} and AUCs, the 90% CI for the ratio of GLSMs is completely contained within the predefined interval of (0.8000, 1.2500).⁶ This procedure is equivalent to Schuirmann's⁷ two one-sided tests at the 0.05 level of significance.

Examples of the SAS code that will be used are as follows:

Mixed Model Analysis

```
proc mixed data = <data in>;  
  by parcatln parcatl pkday paramn param;  
  class trtan aperiod trtseqp usubjid;  
  model lpk = trtan aperiod trtseqp / cl residual ddfm = kr;  
  lsmeans trtan / cl pdiff = control('2') alpha = 0.1;  
  random intercept / subject = usubjid(trtseqp);  
  ods output lsmeans = <data out>;  
  ods output diffs = <data out>;  
  ods output covparms = <data out>;  
run;
```

Food Effect:

A statistical analysis will be conducted to investigate the food effect for 960 mg sotorasib administered orally as 3 x 320 mg tablets under fed condition (test 2) to 960 mg sotorasib administered orally as 3 x 320 mg tablets under fasted condition (test 1) for AUC_{last} , AUC_{inf} and C_{max} . Data from 14 subjects who are enrolled in Period 3 will be used for this analysis.

The natural log (ln)-transformed⁴ PK parameters will be analyzed using a mixed model.⁵ The model will include treatment as fixed effect and subject nested within sequence as a random effect.

For AUC_{last} , AUC_{inf} and C_{max} separately, the least squares mean (LSM) for each treatment, difference in LSMs between the test 1 and test 2, and corresponding 90% confidence interval (CI) will be calculated; these values will then be backtransformed to give the geometric least square mean (GLSM), ratio of GLSMs, and corresponding 90% CI.

Additionally, the pooled estimate (across all treatments) of the within-subject CV will be calculated, and residual plots will be produced to assess the adequacy of the model(s) fitted.

Examples of the SAS code that will be used are as follows:

Mixed Model Analysis

```
proc mixed data = <data in>;  
  by parcatln parcatl pkday paramn param;  
  class trtan usubjid;  
  model lpk = trtan / cl residual ddfm = kr;  
  lsmeans trtan / cl pdiff = control('2') alpha = 0.1;  
  random intercept / subject = usubjid(trtseqp);  
  ods output lsmeans = <data out>;  
  ods output diffs = <data out>;  
  ods output covparms = <data out>;  
run;
```

8.6. Safety and Tolerability Assessments

8.6.1. Adverse Events

All AEs will be coded using the Medical Dictionary for Regulatory Activities (MedDRA) Version 24.0 (or higher if a new version is issued during the study; see the DMP for more details). All AEs will be assigned a severity grade using Common Terminology Criteria for Adverse Events (CTCAE) Version 5.0 (or higher if a new version is issued during the study; see the protocol for more details).

A treatment-emergent adverse event (TEAE) will be defined as an AE that starts during or after dosing, or starts prior to dosing and increases in severity after dosing within each period.

A treatment-related TEAE will be defined as a TEAE with a relationship related to the study treatment, as determined by the investigator.

All AEs will be listed. In addition to the data recorded in the database, the listings will include derived onset time and duration. Onset time will be calculated from the time of dosing for TEAEs only.

The frequency of subjects with TEAEs and the number of TEAEs will be summarized for the following categories:

- TEAEs (overall, serious, leading to discontinuation, and leading to death) by treatment
- TEAEs by severity and treatment

- Treatment-related TEAEs (overall, serious, leading to discontinuation, and leading to death) by treatment
- Treatment-related TEAEs by severity and treatment

The frequency of subjects will be summarized separately for TEAEs and treatment-related TEAEs by the following:

- System organ class, preferred term, and treatment
- Preferred term and treatment

For the AE data the following rules will apply:

- For the derivation of treatment-emergent status (applicable to all AEs): If the start date/time of an AE is incomplete or missing, an AE will be assumed to not be a TEAE, unless the incomplete start date/time or the end date/time indicates an AE started after dosing.
- For the derivation of treatment-related status (applicable to TEAEs only): If the study treatment relationship for a TEAE is missing, a TEAE will be assumed to not be a treatment-related TEAE.
- For the derivation of onset time (applicable to TEAEs only): If the start date/time of a TEAE is missing, onset time will not be calculated. If the start date/time of a TEAE is incomplete, where possible, the minimum possible onset time will be calculated and presented in '≥DD:HH:MM' format (eg, if the date/time of dosing is 01MAY2019/08:00 and recorded start date/time of a TEAE is 03MAY2019, then the minimum possible onset time will be calculated by assuming a TEAE started at the first hour and minute of 03MAY2019 [03MAY2019/00:00], thus will be presented as onset time ≥01:16:00 in the listing). If the start date of a TEAE is the same as the date of dosing but the start time of a TEAE is missing, an onset time will be presented as '≥00:00:01'. Any clock changes will be accounted for in the derivation.
- For the derivation of duration (applicable to all AEs): If the end date/time of an AE is missing, duration will not be calculated. If the start or end date/time of an AE is incomplete, where possible, the maximum possible duration will be calculated and presented in '≤DD:HH:MM' format (eg, if the start of an AE date/time is 01MAY2019/08:00 and its recorded end date/time is 03MAY2019, then the maximum possible duration will be calculated by assuming an AE ended at the last hour and minute of 03MAY2019 [03MAY2019/23:59], thus will be presented as duration ≤02:15:59 in the listing). Any clock changes will be accounted for in the derivation.
- For the calculation of TEAE summary statistics: If the severity of a TEAE is missing, that TEAE will be counted under the 'missing' category.

- For the calculation of TEAE summary statistics: If a subject experienced multiple TEAEs with the same preferred term for the same treatment, this will be counted as 1 TEAE for that treatment under the maximum severity recorded.

8.6.2. Clinical Laboratory Parameters

All clinical laboratory parameters, will be listed, as applicable; any value outside the clinical reference range will be flagged. Separate listings will be provided for any parameter for which there is any individual subject value outside the respective clinical reference range.

Summary tables by treatment and timepoint will be provided for clinical chemistry and hematology parameters.

Values recorded as $<x$, $\leq x$, $>x$, or $\geq x$ will be displayed in the listings as recorded. For the derivation of listing flags, all calculations, and presentation in the figures, $<x$ and $\leq x$ values will be set to 0, whereas $>x$ and $\geq x$ values will be set to x .

8.6.3. Vital Signs Parameters

All vital signs parameters, will be listed, as applicable; any value outside the clinical reference range will be flagged.

Summary tables by treatment and timepoint will be provided by treatment group for all vital signs parameters as applicable.

8.6.4. 12-lead Electrocardiogram Parameters

All 12-lead ECG parameters will be listed; any value outside the clinical reference range will be flagged.

Summary tables by treatment and timepoint will be provided for all 12-lead ECG parameters.

8.6.5. Other Assessments

Medical history will not be listed.

All other safety and tolerability assessments not detailed in the above sections will be listed only.

8.6.6. Safety and Tolerability Statistical Methodology

No inferential statistical analyses are planned.

9. INTERIM ANALYSES

No interim analyses are planned.

10. SIGNIFICANT CHANGES FROM THE PROTOCOL-SPECIFIED ANALYSES

There were no significant changes from the protocol-specified analyses.

11. REFERENCES

1. ICH. ICH Harmonised Tripartite Guideline: Structure and content of clinical study reports (E3). 30 November 1995.
2. ICH. ICH Harmonised Tripartite Guideline: General considerations for clinical trials (E8). 17 July 1997.
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6. Statistical Approaches to Establishing Bioequivalence. Rockville, MD: US Dept of Health and Human Services, Food and Drug Administration, Center for Drug Evaluation and Research (CDER); January 2001.
7. Schuirmann DJ. A comparison of the two one sided tests procedure and the power approach for assessing the equivalence of average bioavailability. *J Pharmacokinet Biopharm*. 1987;15(6):657-680.

12. APPENDICES

Appendix 1: Document History

Status and Version	Date of Change	Summary/Reason for Changes
Final Version 1.0	10Jan2022	Corrected Pinnacle 21 version: Change from: Pinnacle 21 Enterprise Version 4.2.1 To: Pinnacle21 Community Validator 3.1.2
Final Version 1.0	03May2022	SAP page 17 Section Food Effect. Updated wording typo as there's only 1 sequence for Food Effect analysis, there're no subject nested within sequence for the analysis model. Change: The model will include treatment as fixed effect and subject nested within sequence as a random effect. To: The model will include treatment as fixed effect and subject nested-within sequence as a random effect.

NA = not applicable

16.1.9.2. Quality Tolerance Limit Definitions

Parameter	Justification for Parameter	Unit Tolerance
Minimum number of evaluable subjects needed.	A shortfall in the overall number of subjects could have a significant impact on interpretation of the primary endpoint because of limited/insufficient exposure.	N: 146 (enrolled to complete 132)