

**Nektar Therapeutics**  
**Study 18-181-26**

**Statistical Analysis Plan**  
**Version 1.0**  
**25August2019**



**Nektar Therapeutics**

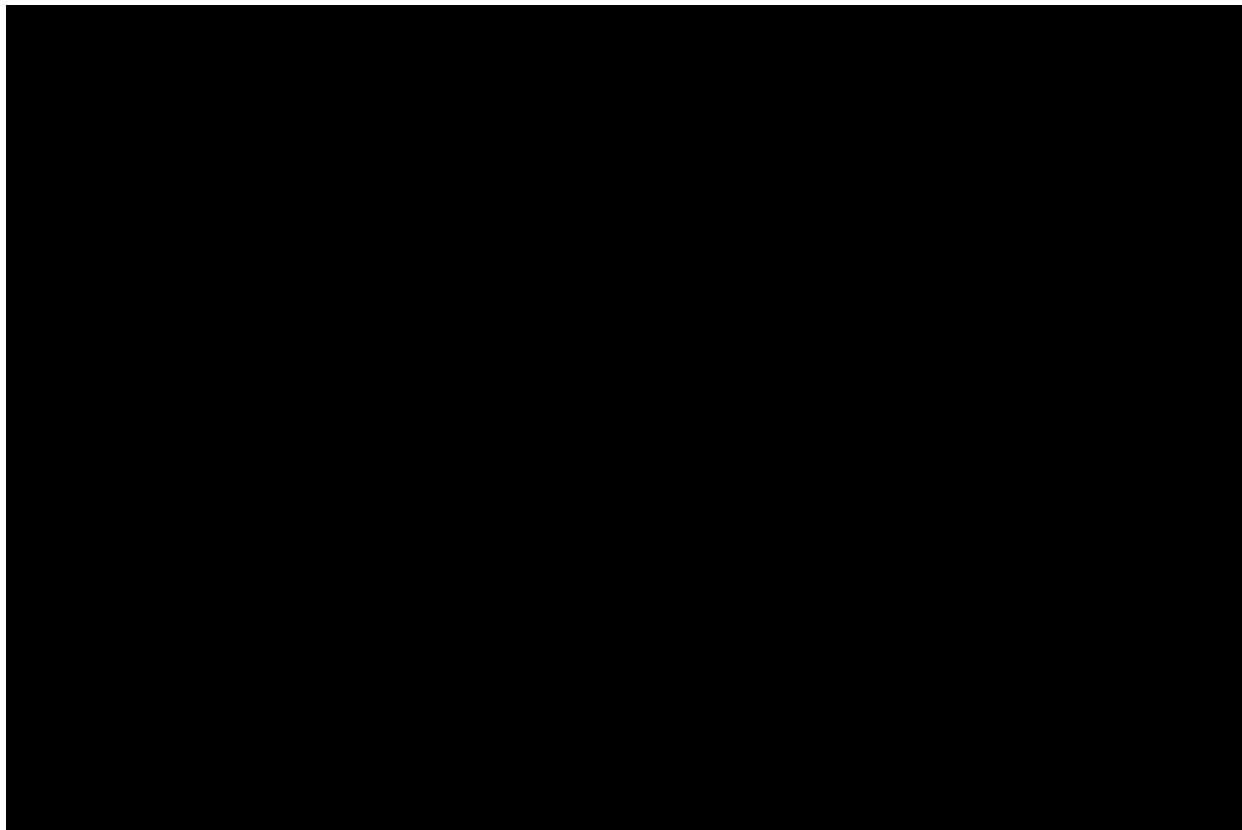
**Statistical Analysis Plan**

**A PHASE 1 DOUBLE-BLIND, DOUBLE-DUMMY, PARALLEL-GROUP,  
RANDOMIZED, POSITIVE CONTROL STUDY USING FUNCTIONAL MAGNETIC  
RESONANCE IMAGING TO EVALUATE THE EFFECT OF NKTR-181 ON BRAIN  
ACTIVITY IN HEALTHY, NON-PHYSICALLY DEPENDENT RECREATIONAL  
OPIOID USERS**

**Protocol Number:** 18-181-26

**Protocol Version:** Amendment 3.0 Dated as 19 June 2019

**Statistical Analysis Plan Version:** 1.0



**CONFIDENTIAL**

**Page 1 of 15**

**Nektar Therapeutics**  
**Study 18-181-26**

**Statistical Analysis Plan**  
**Version 1.0**  
**25August2019**

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>4</b>
<b>2.0</b>	<b>STUDY OBJECTIVES.....</b>	<b>4</b>
<b>3.0</b>	<b>STUDY DESIGN AND PLAN .....</b>	<b>4</b>
<b>4.0</b>	<b>DETERMINATION OF SAMPLE SIZE .....</b>	<b>5</b>
<b>5.0</b>	<b>GENERAL ANALYSIS CONSIDERATIONS .....</b>	<b>5</b>
5.1	Definition of common variables .....	6
5.2	Handling of Partial Dates.....	6
<b>6.0</b>	<b>ANALYSIS POPULATIONS .....</b>	<b>7</b>
<b>7.0</b>	<b>STATISTICAL ANALYSIS .....</b>	<b>7</b>
7.1	Subject Disposition .....	7
7.2	Protocol Deviations.....	8
7.3	Demographic and Baseline Characteristics .....	8
7.4	Prior and Concomitant Medications and Procedures.....	8
<b>8.0</b>	<b>STUDY TREATMENT EXPOSURE .....</b>	<b>8</b>
<b>9.0</b>	<b>PHARMACOKINETIC ANALYSES.....</b>	<b>9</b>
<b>10.0</b>	<b>PHARMACODYNAMIC ANALYSES .....</b>	<b>10</b>
10.1	Functional MRI.....	10
10.2	Pupillometry.....	11
<b>11.0</b>	<b>SAFETY ANALYSES .....</b>	<b>12</b>
11.1	Adverse Events .....	12
11.2	Clinical Laboratory Evaluation.....	13
11.3	Vital Signs.....	13
11.4	Electrocardiogram.....	14
<b>12.0</b>	<b>INTERIM ANALYSES .....</b>	<b>14</b>
<b>13.0</b>	<b>CHANGES TO PROTOCOL-SPECIFIED ANALYSES .....</b>	<b>14</b>
<b>14.0</b>	<b>REFERENCES.....</b>	<b>15</b>

**CONFIDENTIAL**

**Page 2 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

Abbreviation or Term	Definition/Explanation
AE	adverse event
ALT (SGPT)	alanine aminotransferase (serum glutamic pyruvic transaminase)
AST (SGOT)	aspartate aminotransferase (serum glutamic oxaloacetic transaminase)
BMI	body mass index
BP	blood pressure
C <sub>max</sub>	maximum observed plasma concentration
CNS	central nervous system
ECG	electrocardiogram
eCRF	electronic case report form
ICF	informed consent form
MedDRA	Medical Dictionary for Regulatory Activities
MTD	maximum tolerated dose
PK	pharmacokinetic
QTcF	corrected QT interval, Fridericia's correction
RR	respiratory rate
SAE	serious adverse event
SOP	standard operating procedure
SpO <sub>2</sub>	peripheral oxygen saturation
t <sub>½</sub>	terminal elimination half-life
T <sub>max</sub>	time to maximum observed plasma concentration
TEAE	treatment-emergent adverse event

**CONFIDENTIAL**

**Page 3 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

## **1.0 INTRODUCTION**

This document outlines the statistical methods to be implemented during the analyses of data collected within the scope of Nektar Therapeutics Protocol 18-181-26 "A Phase 1 Double-Blind, Double-Dummy, Parallel-Group, Randomized, Positive Control Study Using Functional Magnetic Resonance Imaging To Evaluate The Effect of NKTR-181 on Brain Activity in Healthy, Non-Physically Dependent Recreational Opioid Users". The purpose of this plan is to provide specific guidelines from which the analysis will proceed. Any deviations from these guidelines will be documented in the clinical study report (CSR).

## **2.0 STUDY OBJECTIVES**

The objectives of this study are:

Primary Objective

- To evaluate the effects of oral administration of NKTR-181 on brain activity via fMRI

Secondary Objectives

- To evaluate safety in subjects administered NKTR-181 or oxycodone IR
- To evaluate the objective drug effects of NKTR-181 and oxycodone IR on pupil diameter
- To evaluate the pharmacokinetic profile of NKTR-181 and of oxycodone IR

Exploratory Objective

- To describe the difference between NKTR-181 and oxycodone IR with respect to fMRI signaling in brain reward circuitry

## **3.0 STUDY DESIGN AND PLAN**

This study is a single-center, double-blind, double-dummy, parallel-group, randomized, positive control trial in healthy, non-physically dependent recreational opioid users.

Subjects will enter a Screening period between Day -28 and Day -2. Upon meeting all criteria for enrollment, on Day -1 subjects will enter the clinical research services unit (CRSU) for a 2-day confinement.

On Day 1, following pre-dose collection of blood for assessment of PK parameters and pupillometry procedures, subjects will undergo a baseline fMRI. Upon completion of MRI assessment, subjects will be randomized to NKTR-181 or oxycodone IR.

**CONFIDENTIAL**

**Page 4 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

Treatment Groups:

Group 1: NKTR-181 400 mg and oxycodone placebo

Group 2: Oxycodone IR 40 mg and NKTR-181 placebo

Following randomization, a single dose of the randomized study drug as well as matching placebo of the other study drug will be administered. Post-dose, subjects will undergo a series of four fMRIs (at hours 1, 2, 4, and 8). At post-dose hours 0.5, 1, 2, 3, 4, 5, 6, 8, 12, and 24, pupillometry will be performed and PK blood samples will be drawn. When occurring at times of fMRI, these assessments will be performed prior to the scans.

On Day 2, at least 24 hours post-dosing of study drug, subjects will be discharged from the CRSU. Following a 14- to 17-day safety follow-up period, subjects will return to the CRSU for the End of Study (EOS) visit.

The schedule of assessments is presented in Protocol section 1.2 Schedule of Assessments.

#### **4.0 DETERMINATION OF SAMPLE SIZE**

No formal sample size calculation has been made. Based on experience from previous studies, a total of 24 evaluable subjects (12 per arm) is considered sufficient for the study. An evaluable subject is defined as a subject who completes sufficient fMRI and PK/PD measurements for NKTR-181 or oxycodone IR to allow analysis.

#### **5.0 GENERAL ANALYSIS CONSIDERATIONS**

The statistical analyses will be reported using summary tables and data listings. Continuous variables will be summarized with means, standard deviations, medians, minimums, and maximums. Categorical variables will be summarized by counts and by percentage of subjects in corresponding categories. All summary tables will be presented by treatment - NKTR-181 or Oxycodone, if applicable.

Individual subject data obtained from the case report forms (CRFs) and any derived data will be presented by subject in data listings. Data listings will be sorted by subject, and visit date and time, if applicable.

All analyses and tabulations will be performed using SAS® Version 9.4. All output will be presented in rich text format (RTF).

**CONFIDENTIAL**

**Page 5 of 15**

**Nektar Therapeutics**  
**Study 18-181-26**

**Statistical Analysis Plan**  
**Version 1.0**  
**25August2019**

## **5.1 Definition of common variables**

Unless otherwise specified, the baseline value for each variable is the last non-missing value prior to administration of the study drug NKTR-181 400 mg or oxycodone 40 mg. Study hour 0 is defined as the hour of the study treatment dose.

Study day will be calculated as follows:

For visits/assessments/medications/therapies/adverse events on or post study drug at each period:  
Study Day = (assessment date – date of the study dose) + 1, if assessment date is on or after the study dose date

Study Day = (assessment date – date of the study dose), if assessment date is prior to the study dose date

Study hour will be calculated as follows:

Study Hour = (assessment date time – date time of the study dose)/3600

For purposes of analysis and data display (i.e., means over time), actual visit hours/days are mapped to the planned study visit (i.e., nominal visits such as Hour 0.5, 1, Day 2, etc.) using visit windows. Acceptable visit windows around each scheduled procedure visit will be given for each measurement in the forthcoming sections. Due to the different data collection schedules for the various measurements however, visit windows for different parameters might not be identical.

Unless otherwise specified, in mean and mean change from baseline/pre-dose summaries or analyses, if more than one value are obtained for the same measure within a given visit window, the value closest to the planned study visit day and/or time will be used for reporting and analysis. If multiple values are equally away from the nominal visit day and/or time, the latter one will be used. However, for shift tables, the worst value mapped to that visit window will be used for summary purpose.

## **5.2 Handling of Partial Dates**

In general, no imputation will be considered for missing data or partial dates with the following exceptions:

- For duration of AEs, partially or completely missing dates for start of AE, will be imputed as follows:
  - Missing month and year are not allowed and should be queried. In case of non-resolution of missing month and/or year, no imputation will be performed.

**CONFIDENTIAL**

**Page 6 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

- Start day of AE is missing
  - If the reported month of occurrence of AE is after the Day 1 dose in any period, then day will be imputed as the first day of the month of occurrence of AE.
  - If the reported month of occurrence of AE is the current month as the Day 1 dose in a period, then the missing day will be imputed as the same day as Day 1 in that period.
- For duration of AEs, partially or completely missing dates for stop of AE, will be imputed as follows:
  - If the month is missing, but year is present, either 31st December, the date of discontinuation from the study, or the date of death, whichever is earlier, will be used as the stop date.
  - If the day is missing, but year and month are present, either the last day of that month, the date of discontinuation from the study, or the date of death, whichever is earlier, will be used as the stop date.
  - No imputations will be done for AEs with the year missing in stop dates.

## **6.0 ANALYSIS POPULATIONS**

The safety population will consist of all subjects who receive the single dose of study drug.

The PD population will consist of subjects who have sufficient MRI data for NKTR-181 or oxycodone IR treatment to allow description of modulation of brain circuitry.

The PK population will consist of all subjects who have sufficient plasma concentration data to facilitate the calculation of PK parameters determined by the pharmacokineticist.

## **7.0 STATISTICAL ANALYSIS**

### **7.1 Subject Disposition**

Subject disposition information will be summarized for all subjects. Summaries will include: the number of subjects in safety and PD analysis populations, the number of subjects discontinued study and its reason. All subjects enrolled in the study will be included in the summary table.

**CONFIDENTIAL**

**Page 7 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

## **7.2 Protocol Deviations**

Subjects with one or more protocol deviations or violations will be summarized and listed.

## **7.3 Demographic and Baseline Characteristics**

Demographic variables include: age, sex, ethnicity, and race. Other baseline characteristics include: height, weight, calculated body mass index (BMI), and vital signs. Demographic and baseline characteristics will be summarized for the safety populations.

Age will be calculated as:

Integer [(Date informed consent signed – Date of birth) / 365.25].

BMI will be calculated as:

Weight (kg) / Height (m)<sup>2</sup>.

Medical history will be listed and summarized by System Organ Class/ Preferred Term.

## **7.4 Prior and Concomitant Medications and Procedures**

Verbatim terms on case report forms will be mapped to Anatomical/Therapeutic/Chemical (ATC) class and Preferred Drug Names using the World Health Organization Drug Dictionary Enhanced (WHODDE B3/C3, September 1, 2018).

Prior medications are defined as medications started to take prior to the study dose. Concomitant medications are defined as medications started on or after the day of the study dose.

Prior and concomitant medications will be tabulated for the Safety population by WHODDE ATC level 2 classifications, preferred term, and treatment. If a subject reports the same preferred term multiple times, then the frequency of that preferred term will only be incremented by one. As with the preferred term, if a subject reports multiple medications within the same ATC level 2 classification, then the frequency of that ATC level 2 classification will only be incremented by one. Percentages will be calculated using the total number of subjects in the Safety population. Each summary will be ordered by descending order of incidence of preferred term within each ATC class. Prior and concomitant medications will be included in a data listing.

## **8.0 STUDY TREATMENT EXPOSURE**

The date and time of the study drug dose administrated for each subject will be listed for the Safety population.

**CONFIDENTIAL**

**Page 8 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

## **9.0 PHARMACOKINETIC ANALYSES**

### **9.1 Pharmacokinetic Blood Sample Collection**

For each treatment, blood samples for PK analysis will be obtained at predose (T=0) and 0.5, 1, 2, 3, 4, 5, 6, 8, 12, and 24 hours post dose. Samples will be processed for extraction of plasma, which will be analyzed for concentrations of NKTR-181 and its metabolites oxycodol and oxycodone after NKTR-181 administration and concentrations of oxycodone after oxycodone administration.

For the purpose of PK analysis, plasma concentration values reported as below the limit of quantitation (BLQ) will be treated as zero for pre-dose samples. Plasma concentrations values reported as BLQ at all other times will be considered as missing. Concentration values in any sample matrix reported as NR (not received) or NA (not analyzed) will be treated as missing values.

Unreliable results, such as those arising from procedural errors during conduct of the study or analytical errors will not be used. Observed analyte concentrations that differ from the mean values of all samples at the same time point by more than  $5\times$  standard deviation will be considered outliers (unreliable) and will be excluded from PK analysis. The reason for not using selected data will be described in the CSR.

### **9.2 Pharmacokinetic Analysis**

Plasma PK parameters for

- NKTR 181 and its metabolites, oxycodol and oxycodone, after NKTR-181 administration
- Oxycodone after oxycodone administration

of each subject will be calculated using noncompartmental methods (Phoenix WinNonlin® (Certara USA, Inc., Princeton, NJ)) for the PK population. The actual sampling times will be used in the PK parameter calculations. Calculation of AUC will be performed using linear trapezoidal rule.

Planned parameters include:

- $T_{max}$ : The time to maximum observed plasma concentration for each subject.
- $C_{max}$ : The maximum observed plasma concentration for each subject.

**CONFIDENTIAL**

**Page 9 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

- $AUC_{last}$ : Area under the plasma concentration vs. time curve from time 0 to time of last observed concentration,  $AUC_{last}$  will be expressed in units of ng\*hr/mL.
- $AUC_{0-t}$ : Area under the plasma concentration-time curve from time 0 to time t,  $AUC_{0-t}$  will be expressed in units of ng\*hr/mL.

Individual subject plasma PK concentration-time data for NKTR-181, oxycodol, and oxycodone will be tabulated and summarized by treatment group. Pharmacokinetic parameters for NKTR-181 and its metabolites and oxycodone will be tabulated and summarized. Pharmacokinetic parameters such as maximum concentration ( $C_{max}$ ), time to  $C_{max}$  ( $T_{max}$ ), and the area under the concentration-time curve (AUC) will be estimated from plasma concentration-time data where possible. Data from subjects prematurely ending participation in the study may be excluded from the PK data evaluation.

## **10.0 PHARMACODYNAMIC ANALYSES**

All pharmacodynamics parameters will be analyzed based on the PD population.

### **10.1 Functional MRI**

The effective connectivity is analyzed through Dynamic Causal Modeling (DCM) analysis. The Parametric Empirical Bayes (PEB) approach, as implemented in Statistical Parametric Mapping 12 (SPM12) software (<http://www.fil.ion.ucl.ac.uk/spm/>), will be used to evaluate group effects in the DCM parameters (e.g., if a parameter is different from zero in a single group, or if a parameter is different between groups). The candidate nodes based on the reward circuit in brain regions used by DCM at each time point will be summarized by treatment groups over time. The DCM results will be included in data listings.

Imaging parameters for perfusion will be summarized by treatment group over time after drug administration.

In order to measure the effects of medication at each time point, the baseline and the scans for a post-dose timepoint will be concatenated. The effect of medication will be reflected by the estimated value of the concatenated modulator (DCM B matrix). The results of DCM analysis will be summarized and listed in a data listing.

The node-to-node functional connectivity analysis will be conducted. The regions of interest (ROIs) showing largest group difference in functional connectivity will be selected as DCM nodes for the large extent EC analysis. The ROI will be listed in the data listing.

**CONFIDENTIAL**

**Page 10 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

The following visit window will be used to assign time points that do not occur as scheduled:

Planned Visit	Evaluation Period	Windows for Actual Visits
Day 1	Pre-Dose	study hour < 0 hour in day 1
	Hour 1	0 hours < study hour < 1.5 hours
	Hour 2	1.5 hours ≤ study hour < 3 hours
	Hour 4	3 hours ≤ study hour < 6 hours
	Hour 8	6 hours ≤ study hour < 12 hours

## 10.2 Pupillometry

The time course of treatment mean of pupil diameter and change from baseline will be summarized and displayed graphically to show the visual differences between treatment groups over time.

The following PD endpoints will be derived and summarized descriptively on the pharmacodynamic analysis population.

- Minimal pupil diameter (Emin),
- Maximum of pupil diameter change from baseline (Emin of change),
- Area under the change from baseline curve relative to baseline AUC<sub>0-1h</sub>, AUC<sub>0-2h</sub>, AUC<sub>0-3h</sub>, AUC<sub>0-4h</sub> and AUC<sub>0-12h</sub> .
- Time to the maximum of pupil diameter change from baseline

Time to the maximum of pupil diameter change from baseline. The time (in hours) is calculated as

(The time of maximum pupil diameter change – study drug dose time)/3600

The following visit window will be used to assign time points that do not occur as scheduled:

**CONFIDENTIAL**

**Page 11 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

Planned Visit	Evaluation Period	Windows for Actual Visits
Day 1	Pre-Dose	study hour < 0 hour in day 1
	Hour 0.5	0 ≤ study hour < 0.75 hours
	Hour 1	0.75 hours ≤ study hour < 1.5 hours
	Hour 2	1.5 hours ≤ study hour < 2.5 hours
	Hour 3	2.5 hours ≤ study hour < 3.5 hours
	Hour 4	3.5 hours ≤ study hour < 4.5 hours
	Hour 5	4.5 ≤ study hour < 5.5 hours
	Hour 6	5.5 hours ≤ study hour < 7 hours
	Hour 8	7 hours ≤ study hour < 10 hours
	Hour 12	10 hours ≤ study hour < 16 hours
Day 2		2 ≤ study day ≤ 6

## **11.0 SAFETY ANALYSES**

All safety analyses will be based on the Safety population.

### **11.1 Adverse Events**

An AE is defined as any untoward medical occurrence in a subject who is administered a medicinal product and that does not necessarily have a causal relationship to the treatment. All AEs will be included in the data listings. Verbatim terms on case report forms will be mapped to preferred terms and system organ classes (SOC) using the Medical Dictionary for Regulatory Activities (MedDRA) (version 21.1).

Adverse event summary will be displayed by treatment. Unless otherwise specified, summaries that are displayed by SOC and preferred terms will be ordered alphabetically by SOC, and within each SOC, preferred terms will also be ordered alphabetically. Summaries of the following types will be presented:

- Subject incidence of AEs by MedDRA SOC and preferred term.
- Subject incidence of AEs by MedDRA SOC, preferred term, and severity. Severity will be recorded as deemed by investigator. At each level of subject summarization a subject is classified according to the highest severity if the subject reported one or more events.
- Subject incidence of study drug related AEs by MedDRA SOC and preferred term.
- Subject incidence of AEs by descending incidence of preferred terms.
- Subject incidence of serious AEs by MedDRA SOC and preferred term, if applicable.

**CONFIDENTIAL**

**Page 12 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

- Subject incidence of AE leading to early termination by MedDRA SOC and preferred term, if applicable.

Any AE that occurs on or after the study dose administration will be summarized.

For each subject and for each adverse event, the duration of the event will be calculated as:

$$\text{Duration of AE} = \text{AE stop date} - \text{AE start date} + 1.$$

The duration of AEs will be displayed in the data listing.

## **11.2 Clinical Laboratory Evaluation**

Hematology and chemistry parameters will be summarized using descriptive statistics at post-dose. Changes from baseline will also be summarized.

Shift tables (ie, Low/Normal/High at baseline versus Low/Normal/High) will be provided to assess changes in laboratory values from baseline to post-dose assessment. Only non-missing assessments at baseline and post-dose will be analyzed.

Any clinically significant lab abnormalities will be determined by the Principal Investigator and will be reported in the AE table summaries.

The following visit window will be used to assign time points that do not occur as scheduled:

Planned Visit	Evaluation Period	Lab Windows for Actual Visits
Day -28 – Day -2	screening	$-28 \leq \text{study day} \leq -2$ prior to first period dose
Day -1	Check-In	study day = -1
Day 2	Day 2	$1 \leq \text{study day} \leq 6$
EOS	16-19 days after the study dose	study day > 6 days after the study dose

## **11.3 Vital Signs**

Vital signs, including Oxygen Saturation (SpO2), will be summarized using descriptive statistics at baseline and at each post-dose time point assessed. Changes from baseline will also be summarized.

The following visit window will be used to assign time points that do not occur as scheduled:

**CONFIDENTIAL**

**Page 13 of 15**

**Nektar Therapeutics**  
**Study 18-181-26**

**Statistical Analysis Plan**  
**Version 1.0**  
**25August2019**

:

Planned Visit	Evaluation Period	Windows for Actual Visits
Day -28 – Day -2	Screening	-28 days $\leq$ study day $\leq$ -2 day
Day -1	Check-In	-1 days $\leq$ study day $\leq$ -1 day
Day 1	Pre-Dose	study hour < 0 hour in day 1
	Hour 1	0 $\leq$ study hour < 1.5 hours
	Hour 2	1.5 hours $\leq$ study hour < 4 hours
	Hour 6	4 hours $\leq$ study hour < 16 hours
Day 2		2 $\leq$ study day $\leq$ 6
EOS	16-19 days after the study dose	study day > 6 days after the study dose

#### **11.4    Electrocardiogram**

Overall interpretation results for ECG will be summarized using a shift table (Normal, Abnormal not clinically significant [NCS], Abnormal clinically significant [CS]) comparing baseline to post-dose.

The following visit window will be used to assign time points that do not occur as scheduled:

Planned Visit	Evaluation Period	Windows for Actual Visits
Day -28 – Day -2	Screening	-28 days $\leq$ study day $\leq$ -2 day
Day -1	Check-In	-1 days $\leq$ study day $\leq$ -1 day
Day 1	Pre-Dose	study hour < 0 hour in day 1
	Hour 12	1 $\leq$ study day $\leq$ 6
EOS	16-19 days after the study dose	study day > 6 days after the study dose

#### **12.0    INTERIM ANALYSES**

An interim analysis on fMRI data is planned when first 4 subjects finish 2 days assessments after the study dose. The analysis detail will be in the interim analysis plan.

#### **13.0    CHANGES TO PROTOCOL-SPECIFIED ANALYSES**

No changes from the protocol-specified analyses are planned.

**CONFIDENTIAL**

**Page 14 of 15**

**Nektar Therapeutics  
Study 18-181-26**

**Statistical Analysis Plan  
Version 1.0  
25August2019**

#### **14.0 REFERENCES**

Not applicable.

**CONFIDENTIAL**

**Page 15 of 15**





## **ELECTRONIC RECORD AND SIGNATURE DISCLOSURE**

Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction, and agree to these terms and conditions, please confirm your agreement by clicking the "I agree" button at the bottom of this document.

### **Required hardware and software**

Operating Systems:	Windows® 2000, Windows® XP, Windows Vista®; Mac OS® X
Browsers:	Final release versions of Internet Explorer® 6.0 or above (Windows only); Mozilla Firefox 2.0 or above (Windows and Mac); Safari™ 3.0 or above (Mac only)
PDF Reader:	Acrobat® or similar software may be required to view and print PDF files
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	Allow per session cookies

\*\* These minimum requirements are subject to change. If these requirements change, you will be asked to re-accept the disclosure. Pre-release (e.g. beta) versions of operating systems and browsers are not supported.

### **Acknowledging your access**

To confirm to us that you can access this information electronically, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to the terms and conditions described above, please let us know by clicking the 'I agree' button below.

By checking the 'I agree' box, I confirm that:

- I can access and read this electronic consent of ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and
- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and
- In the event of any conflict between the terms of the Electronic Record and Signature Disclosure and the electronically executed agreement, the terms of the electronically executed agreement shall control; and
- I hereby agree that any agreements which are executed electronically through this account when executed and delivered shall be a legally-binding document that will have the same effect as physical delivery of the paper document bearing the original signature. I hereby agree that I have the power and authority of my company to execute and deliver this document on behalf of my company.

**Nektar Therapeutics**  
**Study 18-181-26**

**Interim Analysis Plan**  
**Version 1.0**  
**15February2019**



**Nektar Therapeutics**

**Interim Analysis Plan**

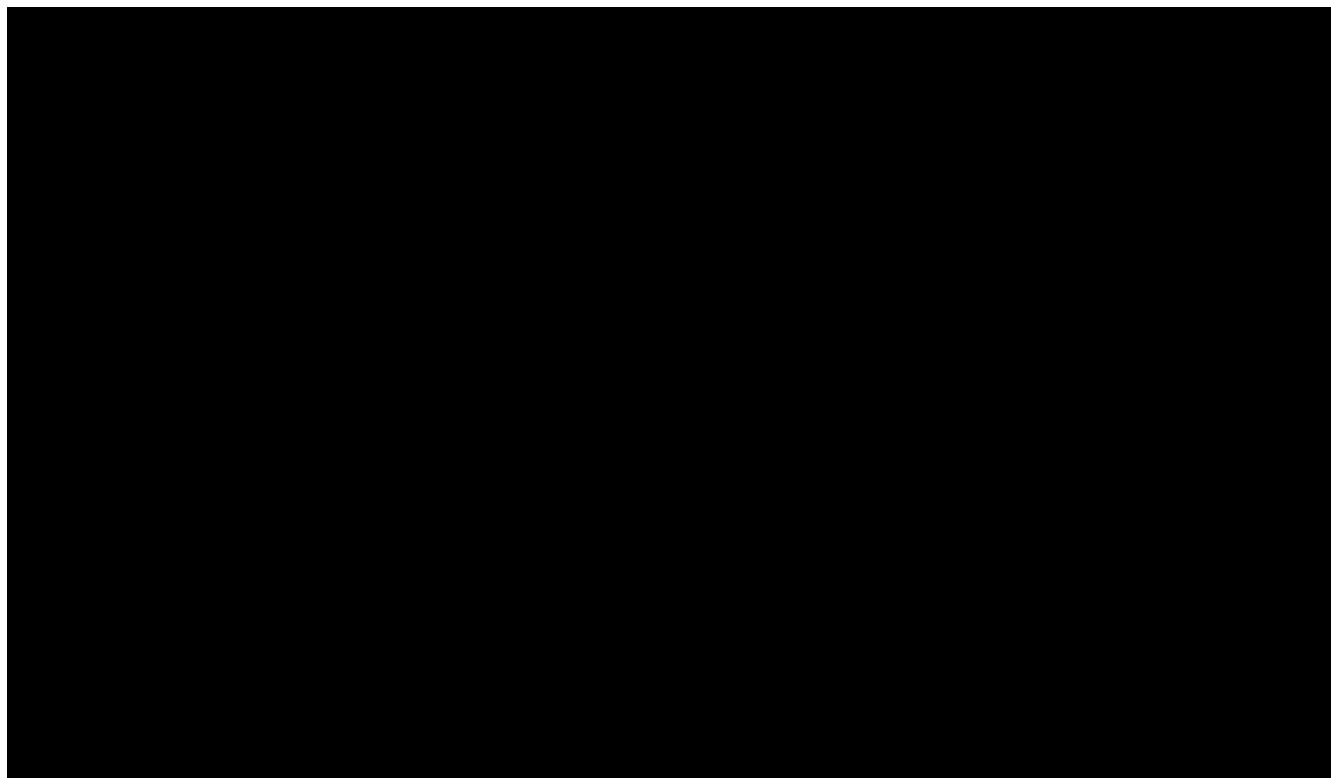
**A PHASE 1 DOUBLE-BLIND, DOUBLE-DUMMY, PARALLEL-GROUP,  
RANDOMIZED, POSITIVE CONTROL STUDY USING FUNCTIONAL MAGNETIC  
RESONANCE IMAGING TO EVALUATE THE EFFECT OF NKTR-181 ON BRAIN  
ACTIVITY IN HEALTHY, NON-PHYSICALLY DEPENDENT RECREATIONAL  
OPIOID USERS**

**Protocol Number:** 18-181-26

**Protocol Version:** Amendment 2.0 dated as 20 November 2018

**Interim Analysis Plan Version:** 1.0

**Date:** 15 February 2019



**CONFIDENTIAL**

Nektar Therapeutics  
Confidential and Proprietary

**Page 1 of 5**

Page 19 of 26

**Nektar Therapeutics**  
**Study 18-181-26**

**Interim Analysis Plan**  
**Version 1.0**  
**15February2019**

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>3</b>
<b>2.0</b>	<b>GENERAL ANALYSIS CONSIDERATIONS.....</b>	<b>3</b>
2.1	Definition of common variables .....	3
<b>3.0</b>	<b>STATISTICAL ANALYSIS .....</b>	<b>4</b>
3.1	Demographic and Baseline Characteristics .....	4
<b>4.0</b>	<b>FUNCTIONAL MRI ANALYSES .....</b>	<b>4</b>
<b>5.0</b>	<b>SUMMARY TABLES FOR INTERIM ANALYSIS.....</b>	<b>5</b>

**CONFIDENTIAL**

Nektar Therapeutics  
Confidential and Proprietary

**Page 2 of 5**

Page 20 of 26

**Nektar Therapeutics  
Study 18-181-26**

**Interim Analysis Plan  
Version 1.0  
15February2019**

## **1.0 INTRODUCTION**

An interim analysis on fMRI data is planned when first 4 randomized subjects have been dosed with study drug and undergone functional MRI (fMRI) scanning. The purpose of the analysis is to explore any treatment differences on effective connectivity using fMRI imaging parameters. This document outlines the analysis to be implemented during the interim analysis.

## **2.0 GENERAL ANALYSIS CONSIDERATIONS**

The statistical analyses will be reported using summary tables or data listings. Continuous variables will be summarized with means, standard deviations, medians, minimums, and maximums. Categorical variables will be summarized by counts and by percentage of subjects in corresponding categories. All summary tables will be presented by treatment - NKTR-181 or Oxycodone IR, if applicable.

All analyses and tabulations will be performed using SAS<sup>®</sup> Version 9.4. All output will be presented in rich text format (RTF).

### **2.1 Definition of common variables**

Unless otherwise specified, the baseline value for each variable is the last non-missing value prior to the study drug NKTR-181 400 mg or oxycodone 40 mg. Study hour 0 is defined as the hour of the study treatment dose.

Study day will be calculated as follows:

For visits/assessments/medications/therapies/adverse events prior to, on, or post the study dose day:

Study Day = (assessment date – date of the study dose) + 1, if assessment date is on or after the study dose date

Study Day = (assessment date – date of the study dose), if assessment date is prior to the study dose date

Study hour will be calculated as follows:

Study Hour = (assessment date time – date time of the study dose)/3600

**CONFIDENTIAL**

**Page 3 of 5**

**Nektar Therapeutics**  
**Study 18-181-26**

**Interim Analysis Plan**  
**Version 1.0**  
**15February2019**

### **3.0 STATISTICAL ANALYSIS**

#### **3.1 Demographic and Baseline Characteristics**

Demographic variables include: age, sex, ethnicity, and race. Other baseline characteristics include: height, weight, calculated body mass index (BMI), and vital signs. Demographic and baseline characteristics will be summarized for the safety populations.

Age will be calculated as:

Integer [(Date informed consent signed – Date of birth) / 365.25].

BMI will be calculated as:

Weight (kg) / Height (m)<sup>2</sup>.

Medical history will be listed and summarized by System Organ Class/ Preferred Term.

### **4.0 FUNCTIONAL MRI ANALYSES**

All fMRI data will be analyzed based on the PD population. The PD population will consist of subjects who have sufficient MRI data for NKTR-181 or oxycodone IR treatment to allow description of modulation of brain circuitry.

The effective connectivity is analyzed through Dynamic Causal Modeling (DCM) analysis. The Parametric Empirical Bayes (PEB) approach, as implemented in SPM12, will be used to evaluate group effects in the DCM parameters (e.g., if a parameter is different from zero in a single group, or if a parameter is different between groups). The candidate nodes based on the reward circuit in brain regions used by DCM at each time point will be summarized by treatment groups over time.

Imaging parameters for perfusion will be summarized by treatment group over time after drug administration.

**CONFIDENTIAL**

**Page 4 of 5**

**Nektar Therapeutics  
Study 18-181-26**

**Interim Analysis Plan  
Version 1.0  
15February2019**

In order to measure the effects of medication at each time point, the baseline and the scans for a post-dose timepoint will be concatenated. The effect of medication will be reflected by the estimated value of the concatenated modulator (DCM B matrix). The results of DCM analysis will be summarized if appropriate.

The node-to-node functional connectivity analysis will be conducted. The regions of interest (ROIs) showing largest group difference in functional connectivity will be selected as DCM nodes for the large extent EC analysis. The ROI will be listed in the data listing.

## **5.0 SUMMARY TABLES FOR INTERIM ANALYSIS**

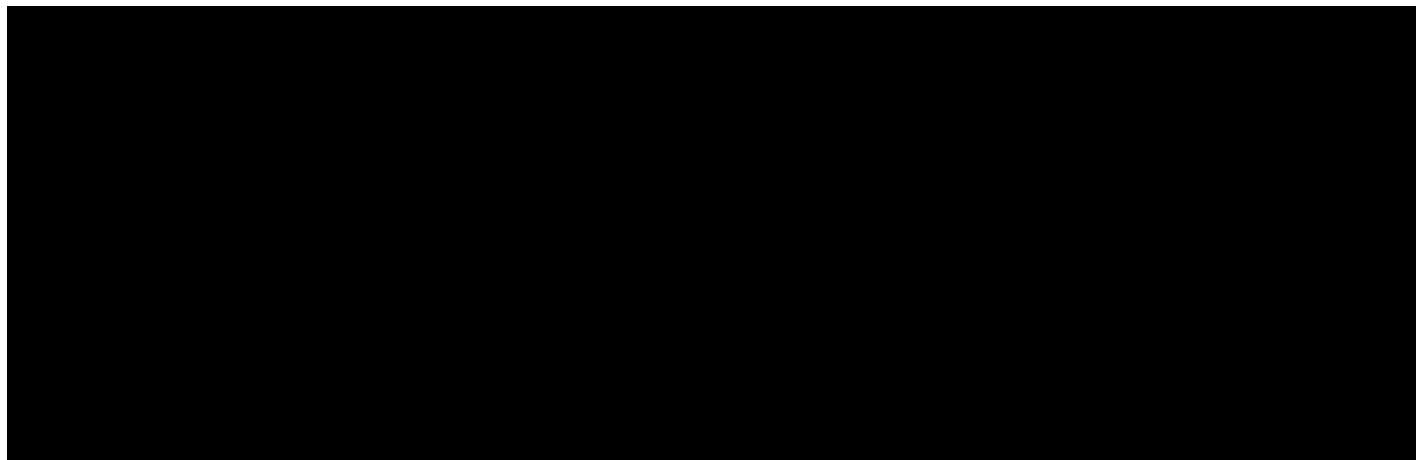
The tables may be adjusted depending on the available data.

- Table 1 Demographics and Baseline Characteristics Safety Population
- Table 2 Summary of Reward Circuit Nodes over Time PD Population
- Table 3 Summary of Imaging parameters for perfusion PD Population
- Table 4 Summary of Effects of Medication over Time Points and Visits PD Population
- Table 5 Summary of Regions of Interest over Time PD Population

**CONFIDENTIAL**

**Page 5 of 5**





## **ELECTRONIC RECORD AND SIGNATURE DISCLOSURE**

Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction, and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

### **Required hardware and software**

Operating Systems:	Windows® 2000, Windows® XP, Windows Vista®; Mac OS® X
Browsers:	Final release versions of Internet Explorer® 6.0 or above (Windows only); Mozilla Firefox 2.0 or above (Windows and Mac); Safari™ 3.0 or above (Mac only)
PDF Reader:	Acrobat® or similar software may be required to view and print PDF files
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	Allow per session cookies

\*\* These minimum requirements are subject to change. If these requirements change, you will be asked to re-accept the disclosure. Pre-release (e.g. beta) versions of operating systems and browsers are not supported.

### **Acknowledging your access**

To confirm to us that you can access this information electronically, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to the terms and conditions described above, please let us know by clicking the 'I agree' button below.

By checking the 'I agree' box, I confirm that:

- I can access and read this electronic consent of ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and
- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and
- In the event of any conflict between the terms of the Electronic Record and Signature Disclosure and the electronically executed agreement, the terms of the electronically executed agreement shall control; and
- I hereby agree that any agreements which are executed electronically through this account when executed and delivered shall be a legally-binding document that will have the same effect as physical delivery of the paper document bearing the original signature. I hereby agree that I have the power and authority of my company to execute and deliver this document on behalf of my company.