Bioequivalence Summary Tables and SAS Transport Formatted Tables for In vitro Release Test (IVRT) and In vitro Permeation Test (IVPT)

Table 1 Submission Summary[1]

Drug Product Name	
Strength(s)	
Applicant Name	
Address	
Point of Contact Name **Address** **Telephone Number** **Fax Number**	

Table 2 Test Formulation Data[2]

Ingredient	**Function**	**Amount mg/g**		**Amount (% w/w)**	
		Strength 1	**Strength 2**	**Strength 1**	**Strength 2**
Total				**100.00**	**100.00**

[1] In lieu of completing Table 1, applicants may provide an electronic copy of Form FDA 356h. The information identified in this table is needed for a complete bioequivalence review and, although required for the archival copy submitted to the Agency, it is frequently not readily available in the bioequivalence submission. The Office of Generic Drugs prefers that this information be submitted as an electronic Form FDA 356h. If this is not possible, then please complete Table 1.

[2] Include the formulation of all strengths in the respective study report, including the formulations used for IVRT sensitivity, specificity and selectivity (fundamental and supplemental) studies and altered formulation(s) for IVPT.

Table 3 Product Information

Study No.		
Product	**Test Product**	**Reference Product**
Treatment ID		
Product Name		
Manufactured by		
Batch No./ Lot no.		
Manufacture Date		
Expiration Date		
Strength		
Dosage Form		
Bio-batch Size		
Production Batch Size		
Potency (Assay)		
Container Content Uniformity (mean, %CV)	Top, middle, bottom	

IVRT Summary Tables

Table 4 Statistical Summary of the Comparative IVRT Data

Drug Product Name and Strength Pivotal IVRT Study No.: Analyte	
Release Rate Comparison	**90 % Confidence Interval Acceptable Limits: 75.00% to 133.33%**
Stage One	
Stage Two (if applicable)	

Table 5 Analytical Method Validation[3]

Information Requested	Analyte
Analytical method validation report location	Provide the sequence No., module, volume(s) and page(s)
Analyte	Provide the name(s) of the analyte(s)
Internal standard	If applicable
Method description	Brief description of sample preparation method; analytical method
Lower limit of quantitation	LLOQ, units
Standard curve concentrations (units/mL)	Standard curve range and appropriate concentration units
QC concentrations (units/mL)	List all the concentrations used
QC Intraday precision range (%)	Range or per QC
QC Intraday accuracy range (%)	Range or per QC
QC Interday precision range (%)	Range or per QC (if applicable)
QC Interday accuracy range (%)	Range or per QC (if applicable)
Bench-top stability (hrs)	Hours @ room temperature
Experimental/In-process stability	Hours @ at highest relevant temperature in receptor solution (e.g. 34°C) during study duration.
Stock stability (days)	Days @ temperature
Working solution stability (hrs)	Hours @ temperature
Long-term storage stability (days)	XX days @ temperature (if applicable)
Sample processing efficiency (recovery)	If applicable
Dilution integrity	Concentration diluted X-fold
Selectivity	No interfering peaks noted in receptor solution If there are interference peaks, please comment.

[3] Submit all method validation standard operating procedures (SOPs) and protocols.

Table 6 IVRT Method Development

Selection of Parameters List all the conditions tested for each study	
Report Location	
Method Parameters	
Equipment evaluated	Equipment name, Equipment specifications
Dose amount (unit)[4]	Range tested
Stirring rate (unit)	
Sampling volume (unit)	
Sampling schedule and duration	
Receptor solution composition	
Type of membranes/Pore size	
Inertness	Concentration tested, Membrane Binding, Recovery (%)
Linearity and Precision (release rate)	

[4] Per USP General Chapter <1724>, for diffusion cell the dosage chamber is recommended to be occluded.

Table 7 IVRT Method Validation

IVRT Method Validation Study No.		
Information Requested	**Data**	
IVRT method validation report location	Include in module 5.3.1	
SOP Name/Location		
IVRT method validation study site		
IVRT Method validation study dates		
Method description		
Equipment Type/ Specification	**Equipment Type**	
	Diffusional Orifice Area (Units):	
	Receptor Solution Volume (Units):	Provide range of volume for all cells (mL)
	No. of Cells Used	
Receptor solution Composition		
Membrane type/Specification	Membrane type/pore size	
Membrane surface temperature (unit)	Specify temperature maintained during validation	
Stirring rate (unit)		
Batch/Lot No. (manufacture or expiry date)		
Dose (unit)	Specify the actual dose amount used during validation (range)	
Dose application method	Describe the method and include applicator's information like type of syringe etc.	
Sampling volume (unit)		
Sampling technique	Aliquot sampling	
Sampling times (e.g., hours)		
Environmental control	Temperature/Humidity Range	

Parameters	
Linearity	Range (lowest value-highest value) of r^2 values for individual diffusion cells in IVRT reproducibility runs
Precision (%) and Reproducibility (% CV))	%CV for intra and inter run Minimum 3 runs (each with min. of 6 replicates)
Dose depletion (unit)	Mean (range)
Sensitivity (min. 3 different strengths for example 50%, 100% and 150%)	Release rate for each strength
Specificity	r^2 value
Selectivity	Specify confidence interval for altered strengths and reference strength
Supplemental selectivity	Specify confidence interval for altered formulation (at same strength) and reference formulation ~~using same strength~~
Robustness	% Difference from the average slope for each parameter variation
Data	Include raw data in validation report

Table 8 IVRT Pivotal Study Information

Study number	
Study title	
Submission location: **Study report**	Bioanalytical Report (location: 5.3.1.4) Study Report (location:5.3.1.2)
Testing Site **(Name & Address)**	
Study dates	
Principal investigator	
Analytical site **(Name & Address)**	
Analytical dates	
Principal analytical investigator	
Sample storage: **(a) Duration (no. of days from the first day of sample collection to the last day of sample analysis)** **(b) Temperature range**	
Long-Term storage stability (LTSS) coverage (no. days @ temp ºC)	Drug in receptor solution
LTSS data location	Specify the exact location of the LTSS study reports and data, including Module, Section, Subsection, and page(s). Provide hyperlink(s) to the locations as appropriate.

Table 9 Summary of Standard Curve and QC Data for IVRT Analysis[5]

Study No. Analyte							
Parameter	**Standard Curve Samples**						
Concentration (units/mL)							
Precision (%CV)[6]							
Accuracy (%Actual)							
Linearity (range of R^2 values)							
Linearity Range (units/mL)							
Sensitivity/LLOQ (units/mL)							

Parameter	**Quality Control Samples**		
Concentration (units/mL)			
Precision (%CV)			
Accuracy (%Actual)			

Table 10 Reanalysis of Study Samples[7]

Study No. Analyte								
Reason why assay was repeated	**Number of samples reanalyzed**				**Number of recalculated values used in reanalysis**			
	Actual number		**% of total assays**		**Actual number**		**% of total assays**	
	T	**R**	**T**	**R**	**T**	**R**	**T**	**R**
Reason A (as applicable)								
Total								

Table 11 SOPs dealing with Sample Analysis Including Analytical Repeats of Study Samples

Study No.		
SOP No.	**Effective Date of SOP**	**SOP Title**

[5] Submit separate table for pivotal and validation studies.
[6] As applicable
[7] If no repeats were performed, insert "0.0."

Table 12A Summary of the Comparative IVRT Data[8],[9]

	Reference Product (Batch/Lot #)						
Test Product (Batch/Lot #)		RS1	RS2	RS3	RS4	RS5	RS6
	TS1	TS1/RS1	TS1/RS2	TS1/RS3	TS1/RS4	TS1/RS5	TS1/RS6
	TS2	TS2/RS1	TS2/RS2	TS2/RS3	TS2/RS4	TS2/RS5	TS2/RS6
	TS3	TS3/RS1	TS3/RS2	TS3/RS3	TS3/RS4	TS3/RS5	TS3/RS6
	TS4	TS4/RS1	TS4/RS2	TS4/RS3	TS4/RS4	TS4/RS5	TS4/RS6
	TS5	TS5/RS1	TS5/RS2	TS5/RS3	TS5/RS4	TS5/RS5	TS5/RS6
	TS6	TS6/RS1	TS6/RS2	TS6/RS3	TS6/RS4	TS6/RS5	TS6/RS6

TS: Test slope; RS: Reference slope

Table 12B Ranking of the Comparative IVRT Data[9,10]

Obs.	T/R Ratio	Percentage
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

[8] Please submit individual concentration data for the in vitro release test (IVRT) study, which were used for calculations of the slopes (release rate) for the test and reference formulations. Please submit complete concentration data in Statistical Analysis System (SAS) transport format (.xpt) at Module 5.3.1.
[9] This table is an example for first stage. Please modify accordingly for second stage.
[10] T/R ratios should be ordered from the lowest to the highest

27		
28		
29		
30		
31		
32		
33		
34		
35		
36		

Sample IVRT SAS Transport dataset

Sample IVRT SAS transport datasets format for each study for IVRT validation and pivotal studies

Raw Measurements Data																	
RANDCODE	**TRT**	**PRODUCT**	**PRODUCT STRENGTH**	**SEQ**	**REP**	**CELL**	**AREA**	**VOLUME**	**DOSE**	**C1**	**C2…**	**Cn**	**T1**	**T2 …**	**Tn**	**SAMPLING**	**ALIQ UOT**

Definition Table for SAS Transport Dataset of Raw Measurement Data

Variable Name	Variable Label	Variable Type	Content	Notes
RANDCODE	Randomization Code	Character/ Alphanumeric/Numeric	Blinded Treatment Code	Unique randomization code
TRT	Treatment/Formulation	Numeric	1 or 2 or 3	1 = Test; 2 = Reference; 3 = altered product
PRODUCT	Treatment Type	Character	TEST or REFERENCE or ALTERED	
PRODUCT STRENGTH	Strength of Formulation	Alphanumeric/Numeric	50 % or 100 % or 150 %	
SEQ	Sequence	Numeric	1 or 2	1 = ABAB...; 2 = BABA…
REP	Replicate number	Numeric	1, 2, 3, 4, 5, 6 etc.	At least 6 replicates recommended
CELL	Individual diffusion cell identifier	Alphanumeric/ Numeric	Cell identification code	Unique diffusion cell identifier
AREA	Dosed area of cell	Numeric	Minimum two or three decimal places	Area in square centimeter (cm^2)

VOLUME	Receptor volume	Numeric	Minimum one or two decimal place(s)	Receptor volume in milliliter (mL)
DOSE	Actual amount of dose applied	Numeric	Minimum one or two decimal place(s)	Actual amount of dose applied in milligram (mg)
C1, C2, Cn, etc.	Receptor sample concentration	Numeric	**Corrected for dilution** Data provided should contain as much precision as is reasonable in terms of decimal points for a given measurement.	Receptor sample concentration in microgram per milliliter (µg/mL)
T1, T2, Tn, etc.	Sampling time point	Numeric	Actual time points	If there are deviations in sampling time points, provide actual time points.
SAMPLING	Sampling type	Character	ALIQUOT	
ALIQUOT	Aliquot volume	Numeric		Aliquot volume in mL if sampling type is Aliquot.

IVPT Summary Tables

Table 13 Summary of IVPT Studies

Study Ref. No.	Study Objective	Treatments (Dose, Dosage Form, Route) [Product ID]	Donor No. (No. Replicates)	Mean Parameters (±SEM)		Study Report Location
				J_{max} (units)	AMT (units)	
Study #	Pivotal study title	Test product strength [Batch #]	# completed	Mean ± SEM	Mean ± SEM	Module#
		Ref. product strength [Batch #]	# completed	Mean ± SEM	Mean ± SEM	

Table 14A Statistical Summary of the Comparative IVPT Data for Unscaled Average BE Studies

Drug Product Name and Strength Dose (Amount of Drug Product) Pivotal IVPT Study No. ; No. of Donors (N)= ; No. of Replicates (r)= Least Squares Geometric Means, Ratio of Means, and 90% Confidence Intervals (CI)							
Parameters	**Test**	**n***	**Reference**	**n***	**T/R Ratio**	**Lower 90% CI**	**Upper 90% CI**
Total Cumulative Amount (AMT) (unit)							
J_{max} (unit)							

***n-Number of observations**

Table 14B Statistical Summary of the Comparative IVPT Data for Scaled Average BE Studies

Parameters	T/R Ratio	Lower 90% CI	Upper 90% CI	s^2_{WR}	s_{WR}	Criteria Bound	Method Used	Outcome
AMTTotal Cumulative Amount (AMT) (unit)								
J_{max} (unit)								

Table 15 – Analytical Method Validation[11]

Information Requested	Analyte
Analytical method validation report location	Provide the sequence, module, report title and page(s)
Analyte	Provide the name(s) of the analyte(s)
Internal standard	If applicable
Method description	Brief description of sample preparation method; analytical method
CC/QC preparation method	Please provide brief description and include matrix used for CC/QC samples
Lower limit of quantitation	LLOQ, units
Standard curve concentrations (units/mL)	Standard curve range and appropriate concentration units
QC concentrations (units/mL)	List all the concentrations used
Recovery of analyte and internal standard	If applicable
QC intraday precision range (%)	Range or per QC
QC intraday accuracy range (%)	Range or per QC
QC interday precision range (%)	Range or per QC
QC interday accuracy range (%)	Range or per QC
Bench-top stability (hrs)	Hours @ room temperature
Experimental/In-process stability	Hours @ at highest relevant temperature in receptor solution (e.g. 34°C)
Stock stability (days)	Days @ temperature
Working solution stability (hrs)	Hours @temperature
Long-term storage stability (days)	XX days @ temperature
Freeze/thaw stability (cycles)	#cycles (if applicable)
Sample processing efficiency (recovery)	If applicable
Dilution integrity	Concentration diluted X-fold
Selectivity	No interfering peaks noted in blank matrix (for IVPT receptor solution from non-dosed diffused cell with donor skin)/in presence of antimicrobial agents (if applicable). If there are interference peaks, please comment.

[11] Submit all method validation standard operating procedures (SOPs).

Table 16 Summary of Standard Curve and QC Data for IVPT Sample Analyses[12]

Study No. Analyte							
Parameter[13]	**Standard Curve Samples**						
Concentration (units/mL)							
Precision (%CV)							
Accuracy (%Actual)							
Linearity (range of R^2 values)							
Linearity range (units/mL)							
Sensitivity/LOQ (units/mL)							

Parameter	**Quality Control Samples**		
Concentration (units/mL)			
Precision (%CV)			
Accuracy (%Actual)			

Table 17 Reanalysis of Study Samples[14]

Study No.								
Reason why assay was repeated	**Number of samples reanalyzed**				**Number of recalculated values used in reanalysis**			
	Actual number		**% of total assays**		**Actual number**		**% of total assays**	
	T	**R**	**T**	**R**	**T**	**R**	**T**	**R**
Reason A (as applicable)								
Total								

Table 18 SOPs dealing with Sample Analysis Including Bioanalytical Repeats of Study Samples[15]

Study No.		
SOP No.	**Effective Date of SOP**	**SOP Title**

[12] Include a separate table for each study (IVPT validation, IVPT pilot and IVPT pivotal studies)
[13] For precision and accuracy calculation, consider all runs for each study (IVPT pilot and IVPT pivotal studies)
[14] Include a separate table for each study (IVPT pilot and IVPT pivotal studies) and if no repeats were performed, insert "0.0."
[15] If applicable, provide a separate table for each study (IVPT pilot and IVPT pivotal studies)

Table 19 IVPT Method Development[16]

Selection of Parameters List all the conditions tested for each study	
Report location	
SOP Name/Location	
Skin source	
Skin anatomical site	
No. of Donor(s)	
No. of Replicates per treatment	
Skin integrity test	Test name, range of values considered
Skin thickness	Range of values considered
Equipment evaluated	
Dose amount (unit)[17]	Range tested
Dose application method	Describe dose application and if dose duration is modulated describe dose removal method.
Receptor solution	(Include molarity, pH)
Skin surface temperature	
Drug solubility in receptor solution (units/mL) (@temperature)	
Stirring rate (unit)	
Sampling volume (unit)	
Sampling timepoints	Minimum of 8 non-zero sampling time points
Dose duration	
Study duration	

[16] Submit separate tables for all the studies conducted during method development as applicable
[17] It is recommended to be unoccluded.

Table 20 Study Information[18]

Study number		
Study title		
Study type	☐ IVPT (Pilot)	☐ IVPT (Pivotal)
Submission location: **Study report**	Analytical Report (location, 5.3.1.4) Study Report (location, 5.3.1.2)	
Testing site **(Name & Address)**		
Study dates		
Principal investigator		
Analytical site **(Name & Address)**		
Analytical dates		
Principal analytical investigator		
Sample storage: **(a) Duration (no. of days from the first day of sample collection to the last day of sample analysis)** **(b) Temperature range**		
Long-Term storage stability (LTSS) coverage (no. days @ temp ºC)	Drug in receptor solution (Storage stability is the duration of the first day of sample collection to last day of analysis)	
LTSS data location	Specify the exact location of the LTSS study reports and data, including Module, Section, Subsection, and page(s). Provide hyperlink(s) to the locations as appropriate.	

[18] Include a separate table for each study (IVPT pilot and IVPT pivotal studies)

Table 21 IVPT Method Validation

IVPT Method Validation		
Information requested		**Data**
IVPT Method validation report # and location		Module 5.3.1
IVPT method validation study site		
IVPT Method validation study dates		
Method Description		
Equipment type/ Specification	**Equipment type:**	
	Diffusion area of the orifice (Units):	cm^2
	Diffusion cell volume (Units):	Provide range of volume for all cells (mL)
	Number of cells used	
Stirring rate/Flow rate (unit)		RPM/ mL/min or mL/h
Temperature at the skin surface		
Skin anatomical site		
Skin thickness (unit)		Mean and range
Skin integrity test type		
Skin integrity test instrument		
Skin integrity acceptance criteria		
Skin integrity test results		Mean and range
Skin storage temperature (unit)		
Receptor solution		
Anti-microbial agent and concentration in receptor solution		
Drug solubility in receptor solution (units/mL)(@temperature)		
Drug stability in receptor solution (exposed to underside of skin)		At highest relevant temperature in receptor solution (e.g. 34°C) for the duration of study or for the longest interval between sampling time points for methods in which the entire receptor solution is replaced at each sampling time point.
Batch/Lot No. (manufacture or expiry date)		

IVPT Pilot Study No.	
Study title	
Randomization	
Number of donors/Replicates	e.g. minimum of 4 replicate per donor (4-6 donors) per treatment
Dose Depletion (unit)	
IVPT Selectivity	Please submit comparative flux and AMT of Test, Reference and Alter formulations. Submit in table and figure format for mean (with error bars) and individual replicates for each donor in the study report.
SOP Name/location	
Dose amount (unit)	
Dose duration	
Dose application method	
Receptor sampling procedure	
Sampling volume (unit)	
Sampling times (hours)	
Environmental control	Temperature/Humidity Range
IVPT Sensitivity	Please submit comparative flux and AMT of drug permeated profiles for each treatment using selected approach (e.g. modulation of dose amount, dose duration or product strength, as applicable). Submit in table and figure format for mean (with error bars) and individual replicates for each donor in the study report.

Table 22 Summary of Pilot IVPT Endpoints[19]

Study No.:							
Donor	Intra 1	Intra 2	Intra 3	Intra 4	Intra 5	Intra n	Inter Donor
Mean: Test							

[19] Include a separate table for IVPT pilot study for each parameter of Jmax and AMT.

Precision (%CV): Test							
Mean: RS							
Precision (%CV): RS							
Mean: Altered Formulation[20]							
Precision (%CV): Altered Formulation							

[20] Formulation designed to be different from the reference product using the same strength.

Sample IVPT SAS Transport dataset

Sample IVPT SAS transport datasets format for each study for IVPT validation and pivotal studies

Raw Measurements Data*															
RANDCODE	**TRT**	**PRODUCT**	**DONOR**	**SEQ**	**REP**	**CELL**	**AREA**	**VOLUME**	**DOSE**	**TEWL**	**THICKNESS**	**C**	**T**	**SAMPLING**	**ALIQUOT**
H	**1**	**T**	**1**	**1**	**1**	**1**	**x**	**x**	**x**	**x**	**x**	**x**	**0**	**x**	**x**
H	**1**	**T**	**1**	**1**	**1**	**1**	**x**	**x**	**x**	**x**	**x**	**x**	**2**	**x**	**x**

Note: Please provide concentration data in rows as shown in the table above.

Definition Table for SAS Transport Dataset of Raw Measurement Data

Variable Name	Variable Label	Variable Type	Content	Notes
RANDCODE	Randomization Code	Character/ Alphanumeric/Numeric	Blinded Treatment Code	Unique randomization code
TRT	Treatment/Formulation Group	Numeric	1 or 2 or 3 or 4	1 = Test; 2 = Reference; 3 = altered product; 4 = Control; which is a non-dosed control diffusion cell. See guidance for additional details.
PRODUCT	Treatment Type	Character	T or R or A or C	T=Test, R=Reference, A=altered product, C=Control
DONOR	Donor Identifier	Alphanumeric/Numeric	Donor identification code	Unique identifier for donor
SEQ	Sequence	Numeric	1 or 2	1 = TRTR...; 2 = RTRT…
REP	Replicate number	Numeric	1,2, 3, 4, etc.	At least 4 replicates recommended
CELL	Individual diffusion cell identifier	Alphanumeric/ Numeric	Cell identification code	Unique diffusion cell identifier

AREA	Dosed area of cell	Numeric	Minimum two or three decimal places	Area in square centimeter (cm^2)
VOLUME	Receptor volume	Numeric	Minimum one or two decimal place(s)	Receptor volume in milliliter (mL)
DOSE	Actual amount of dose applied	Numeric	Minimum one or two decimal place(s)	Actual amount of dose applied in milligram (mg)
TEWL	TEWL Value	Numeric	Minimum one or two decimal place(s)	Value of transepidermal water loss (TEWL) ($g/m^2/h$)
THICKNESS	Thickness of skin section	Numeric	Minimum two or three decimal places	Measured value of skin section thickness in millimeter (mm)
C	Receptor sample concentration	Numeric	Corrected for dilution Data provided should contain as much precision as is reasonable in terms of decimal points for a given measurement.	Receptor sample concentration in nanogram per milliliter (ng/mL)
T	Sampling time point	Numeric	Actual time points	If there are deviations in sampling time points, provide actual time points.
SAMPLING	Sampling type	Character	ALIQUOT or FULL REPLACEMENT	
ALIQUOT	Aliquot volume	Numeric		Aliquot volume in mL if sampling type is Aliquot.

PK Parameters Data								
RANDCODE	**TRT**	**PRODUCT**	**DONOR**	**SEQ**	**REP**	**CELL**	**JMAX**	**AMT**

Definition Table for SAS Transport Dataset of Individual PK Parameters Data

Variable Name	Variable Label	Variable Type	Content	Notes
RANDCODE	Randomization Code	Character/ Alphanumeric/Numeric	Blinded Treatment Code	Unique randomization code
TRT	Treatment/Formulation Group	Numeric	1 or 2 or 3 or 4	1 = Test; 2 = Reference; 3 = altered product; 4 = Control; which is a non-dosed control diffusion cell. See guidance for additional details.
PRODUCT	Treatment type	Character	TEST or REFERENCE or ALTERED or CONTROL T or R or A or C T or R or A or C	T=Test, R=Reference, A=altered product, C=Control
DONOR	Donor identifier	Alphanumeric/Numeric	Donor identification code	Unique identifier for donor
SEQ	Sequence	Numeric	1 or 2	1 = TRTR...; 2 = RTRT…
REP	Replicate number	Numeric	1,2, 3, 4, etc.	At least 4 replicates recommended
CELL	Individual diffusion cell identifier	Alphanumeric/Numeric	Cell identification code	Unique diffusion cell identifier

JMAX	Jmax	Numeric	Minimum two or three decimal places	Maximum flux in nanogram per square centimeter per hour (ng/cm^2/hr). See guidance for additional details.
AMT	Total cumulative amount	Numeric	Minimum two or three decimal places	Total cumulative amount in ng. See guidance for additional details.

Submission of Data from IVRT/IVPT Studies

For the most recent versions of FDA's study data guidance and technical specifications, please refer to FDA's Study Data Standards Resources page located at http://www.fda.gov/ForIndustry/DataStandards/StudyDataStandards/default.htm. This page includes:

- FDA's guidance for industry on study data standards (Guidance for Industry, *Providing Regulatory Submissions in Electronic Format—Standardized Study Data*)
- FDA's technical guide on study data standardization (Technical Specifications Document, *Study Data Technical Conformance Guide*)
- FDA Data Standards Catalog, which contains the standards, formats, and terminologies that should be followed in preparing the study data for electronic submission to FDA.