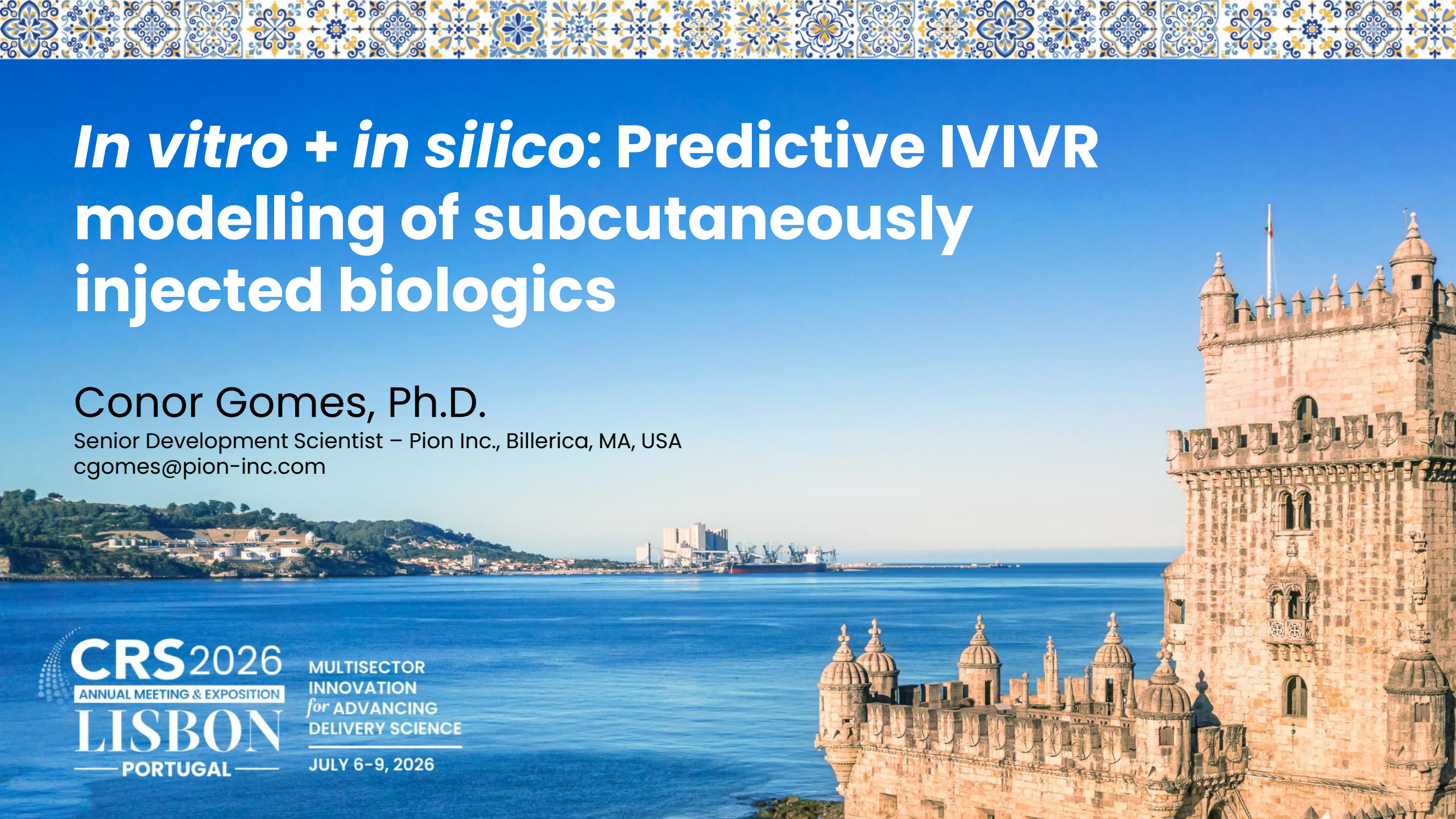




In vitro + in silico: Predictive IVIVR modelling of subcutaneously injected biologics

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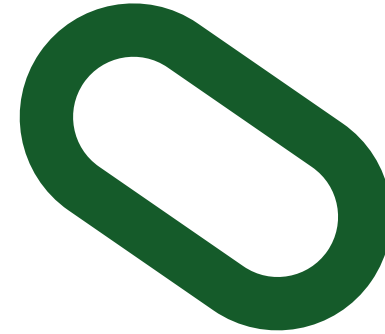
JULY 6–9, 2026



Brief introduction into
barriers to predicting
subcutaneous drug
performance



Our approach on how
we use *in vitro* + *in silico*
methods for prediction



IVIVR and our success
predicting SC %BA
across 16 biologics



Translatability



Reliability



Complexity

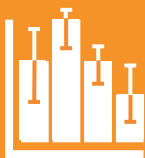


Guidance



Translatability

There's a gap in translation of data **from *in vitro* to preclinical to clinical** with regards to bioavailability after SC administration



Reliability



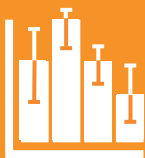
Complexity



Guidance



Translatability



Reliability

Animal studies are **unreliable and often fail to represent** the human situation risking late-stage drug failures



Complexity



Guidance



Translatability



Reliability



Complexity

Most bench-top testing is **too simple and poorly predicts** *in vivo* situations especially for subcutaneous drugs



Guidance



Translatability



Reliability



Complexity



Guidance

Guidance is changing with the emergence of NAM use, but there's still **no singular standardized approach** for subcutaneous drug testing *in vitro*

SCISSOR N3

SUBCUTANEOUS INJECTION SITE SIMULATOR



1 INJECTION

Formulation is injected into the cartridge



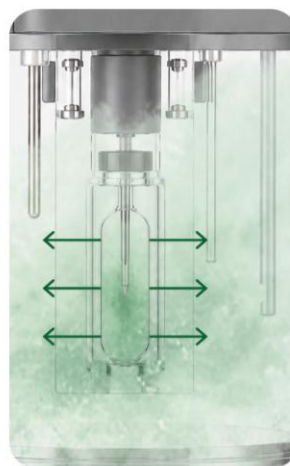
2 DIFFUSION

The bolus diffuses through the ECM in the cartridge



3 RELEASE

API is released via membranes into the chamber



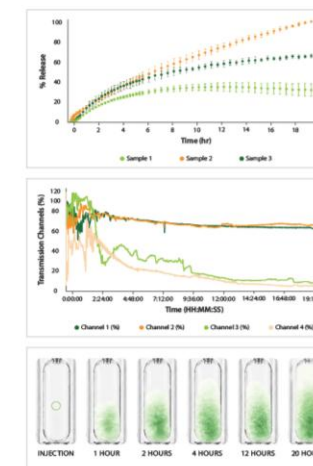
4 DETECTION

Real-time UV-Vis tracks % Release; LEDs monitor cartridge turbidity



5 DATA & INSIGHT

Drug performance and behaviour data generated



In Vitro Analysis

Test Samples:

- 16 commercially available biologics
- Spanning **49 – 95% human bioavailability**
- Assayed with Custom A ECM in SCISSOR

Molecule	Conc.	Clinical %BA value
mAb A	200mg/ml	76 - 88
mAb B	150 mg/ml	85
Protein A	150 mg/ml	80 - 95
mAb C	150 mg/ml	63 - 67
mAb D	150 mg/ml	74 - 89
mAb E	150 mg/ml	62 (53 - 71)
mAb F	131.6 mg/ml	80
mAb G	146 mg/ml	~52
mAb H	90 mg/ml	57 - 78
mAb I	100 mg/ml	49
mAb J	100mg/ml	50 - 53
mAb K	100 mg/ml	64 (52 - 82)
mAb L	10 mg/ml	71
mAb M	25 mg/ml	64
mAb N	60 mg/ml	61 - 64
Fusion Protein A	50 mg/ml	76 OR 58%

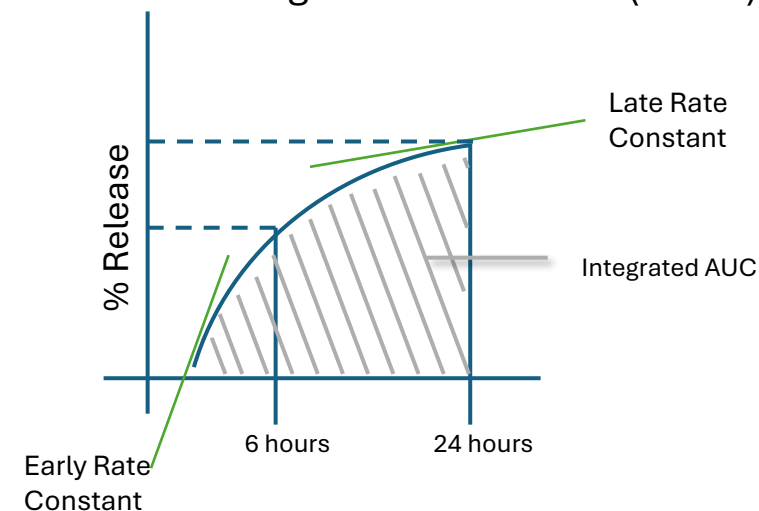
In Silico Analysis

Release Curve Parameters:

- % Release at 6 and 24 h
- Early and Late Release Rate
- Area Under the Curve

AI/Machine Learning:

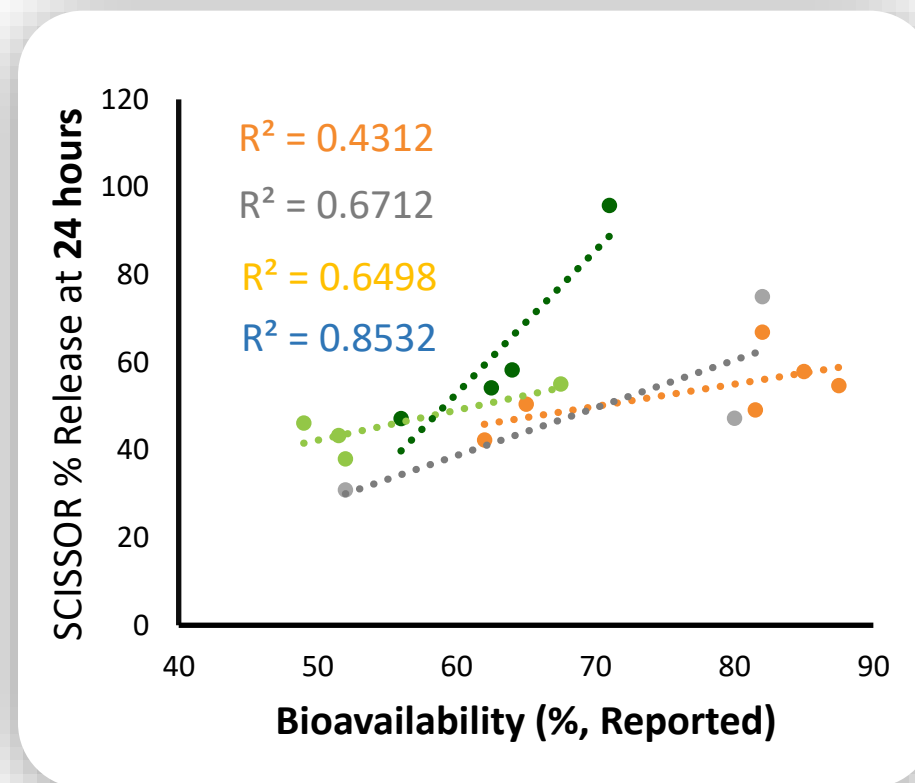
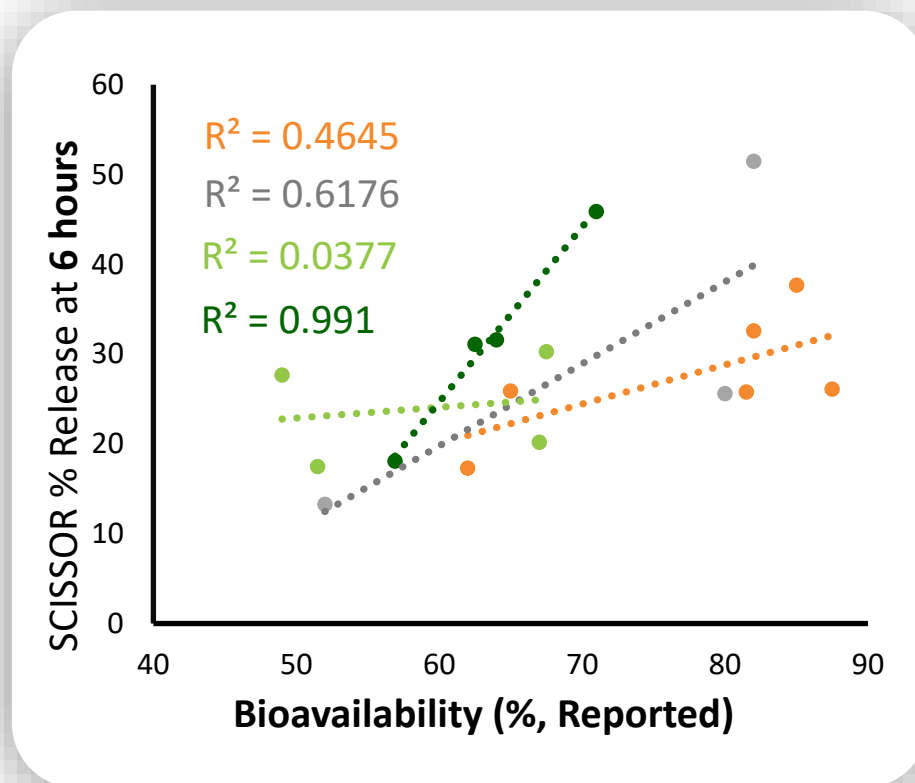
- Self-validating exclusion model (SVEM)





Sample Conc.

>150 mg/mL
~125 mg/mL
~100 mg/mL
<70 mg/mL



IVIVR from direct SCISSOR %release grouped at 6 & 24 hrs **show correct rank order with a good correlation** to clinical bioavailability values with R^2 values at 6 = {0.038-0.99} and 24-hour R^2 = {0.43-0.85}

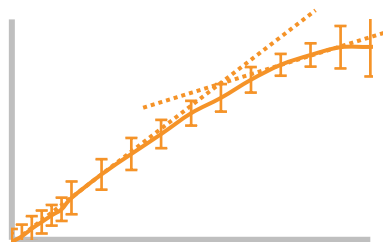
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In Vitro analysis
using SCISSOR



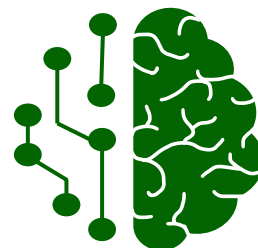
2

Release curve
parameterization
with SubQ Predictor



3

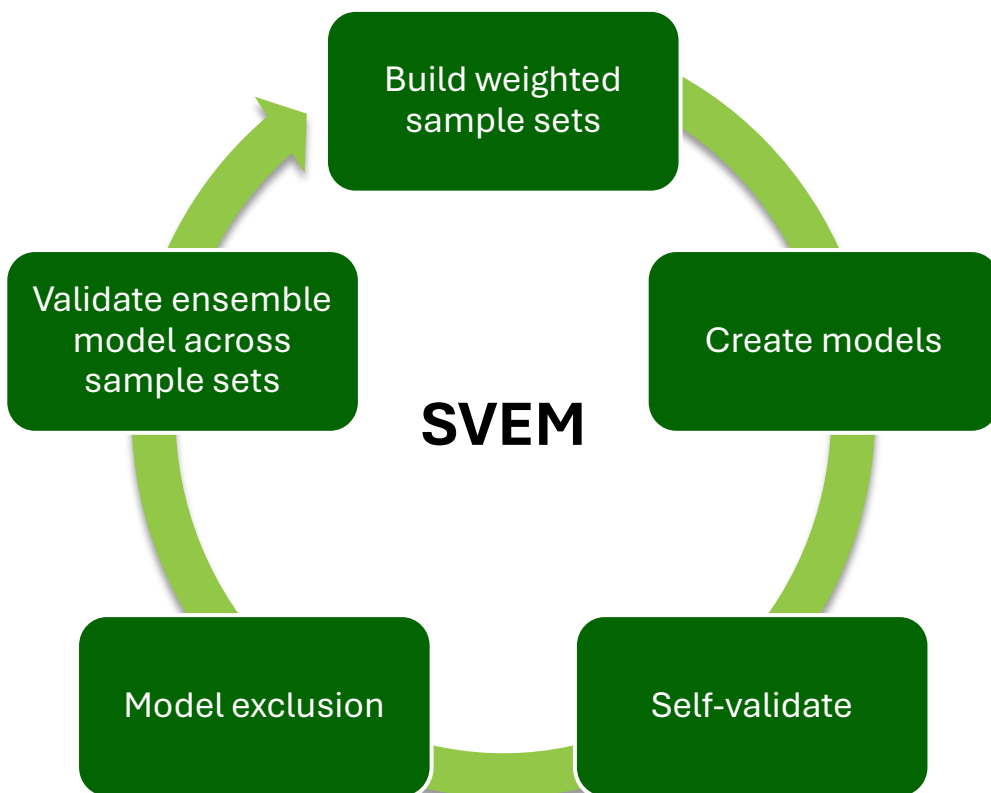
AI/ML
SVEM Model
implementation



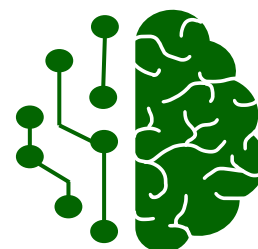
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IVIVR
Generation

%BA



3
AI/ML
SVEM Model
implementation

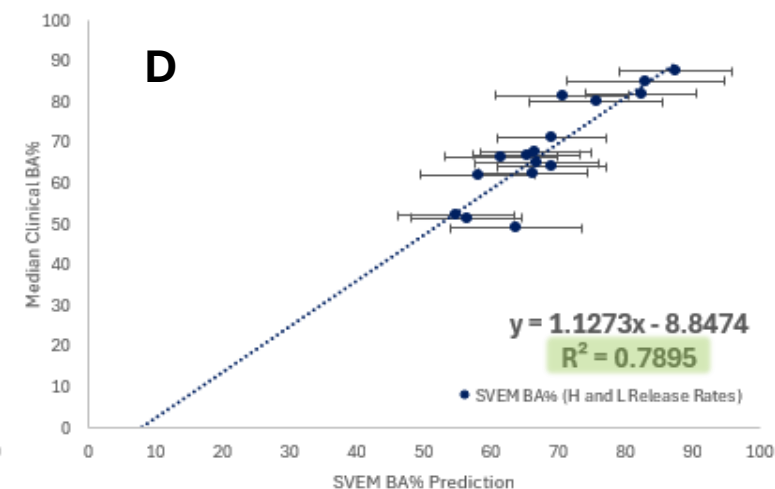
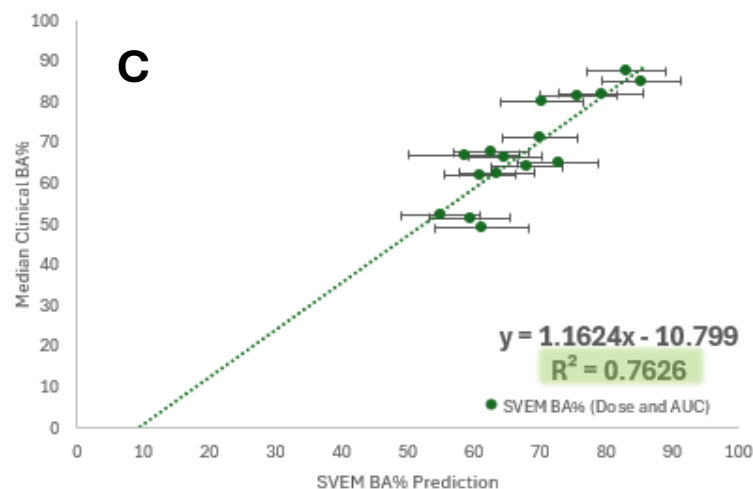
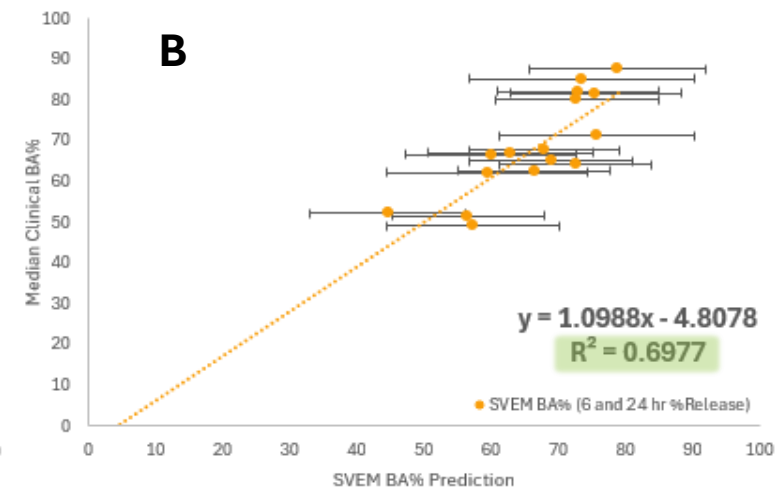
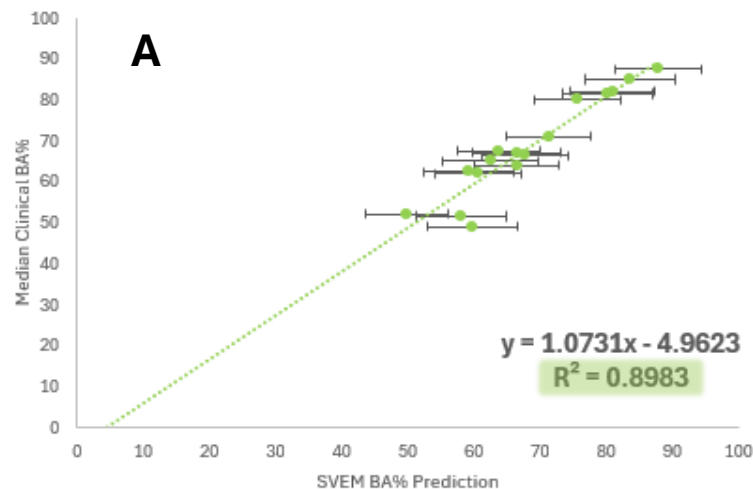


4
IVIVR
Generation
%BA



Improved correlation seen with the addition of *in silico* predictions

- Highest and lowest absorption rate constants
- % of the released dose at 6 hours and 24 hours
- Injected sample mass and area under the curve (AUC)
- Highest and lowest observed release rates





***In vitro* SCISSOR data alone provides strong IVIVR** for rank-ordering mAb candidates



***In vitro* + *in silico* can provide a stronger IVIVR -**
SCISSOR + SVEM increased the correlation to *in vivo* %BA prediction from an average of $R^2 \approx 0.59$ to $R^2 \approx 0.89$



Next steps

- Further validation work with mAb injectables ongoing
- Expanding the application space of SCISSOR to other new API-delivery motifs

Thank You!

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Come and visit
us at **Booth 34!**



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