## Table S1. Survey Questions and Responses

Question	Answers	Responses (%)	# of Responses	# Skipped
1. How many employees does your company	< 500 employees	6.25%	2	1
have?	500-2,000 employees	21.88%	7	
	2,001-10,000 employees	34.38%	11	
	> 10,000 employees	37.50%	12	
2. What type of therapy is the focus at your	Primarily small molecules	40.63%	13	1
company?	Primarily biologics	6.25%	2	
	Mixed	53.13%	17	
3. Which of the following therapeutic areas is	Oncology	57.58%	19	0
the focus at your company (select all that	Neuroscience	66.67%	22	
apply)?	Autoimmune disorders	54.55%	18	
	Infectious diseases	33.33%	11	
	Cardiovascular	30.30%	10	
	Metabolic disorders	27.27%	9	
	Rare diseases	39.39%	13	
	Other	39.39%	13	
4. How well defined is the term "quantitative	The use of the term QSP to describe models is well defined; it is clear	18 18%	6	0
systems pharmacology" (QSP) at your	which models are QSP models and which are not.	10.1070	0	0
company?	The use of the term QSP to describe models is loosely defined; it is somewhat unclear which models are QSP models and which are not.	54.55%	18	
	My company does not use the term QSP to describe its modeling activities or does not perform QSP modeling (internally or externally)	27.27%	9	
	actives of does not perform Qor modering (micrially) of externally).			
The remaining questions were not answered by t	he 9 responders that indicated in question 4 that they do not use QSP modelin	ng.		
5. As the term is used at your company, which of the following are typical or required	QSP models include mechanistic detail on biological and/or therapeutic processes	83.33%	20	9
characteristics of QSP models (select all that apply)?	QSP models represent a complex, interconnected, and multi-scale system, described by variables and/or parameters	58.33%	14	
	QSP models utilize diverse types of data, including "-omics" data	41.67%	10	
	QSP models incorporate effect of drugs, including PK if available	75.00%	18	
	Other	16.67%	4	
6. Which of the following models would your company define as a QSP model (select all that	Mechanistic PK/PD models based on known/hypothesized biological/therapeutic mechanisms	79.17%	19	9
apply)?	Comprehensive model of known/hypothesized biological/therapeutic mechanisms, including feedbacks, and redundancies	83.33%	20	
	Mechanistic PBPK models	50.00%	12	
	Mechanism-based pathway or signaling transduction models (e.g., deterministic ODE models)	83.33%	20	
	Data-driven pathway or signaling transduction models (e.g., influence networks)	41.67%	10	
	Spatial-temporal models of drug delivery and/or effects (e.g., computational fluid dynamics models)	33.33%	8	
	Ouantitative structure–activity relationship (OSAR) models	0.00%	0	
	Machine learning approaches (e.g., Bayesian networks) applied to biological problems	8.33%	2	
	Agent-based models applied to biological problems	16.67%	4	
	None of these are QSP models	0.00%	0	
	Unsure (QSP is loosely defined)	20.83%	5	
7. To what department do your preclinical OSP	DMPK	58.33%	14	9
modelers belong (select all that apply)?	Preclinical PKPD/Modeling & Simulation group	41.67%	10	
- · · · · · · · · · · · · · · · · · · ·	Clinical Pharmacology	29.17%	7	
	Computational Biology/Bioinformatics	16.67%	4	
	Statistics	0.00%	0	
	Discovery/Biology Research	8.33%	2	
	Other	16.67%	4	
8. What is the academic background of your company's QSP modelers (select all that apply)?	Pharmacokinetics/Pharmaceutical Sciences	75.00%	18	9
	Pharmacology	41.67%	10	
	Computational Biology/Bioinformatics	50.00%	12	
	Engineering	58.33%	14	
	Computer Science	16.67%	4	
	Mathematics	33.33%	8	
	Statistics	8.33%	2	
	Physical Sciences	25.00%	6	
	Life Sciences	29.17%	/	
	Other background	4.17%	1	

Question	Answers	Responses (%)	# of Responses	# Skipped
9. How many QSP modeling full-time	<1	37.50%	9	9
equivalents (FTEs) does your company have?	1-2 FTE	16.67%	4	
	3-5 FTE	8.33%	2	
	6.10 FTF	25.00%	6	
		12.50%	2	
10. Do you have staff assigned as part time	I0+FIE No	12.50%	3	0
OSP modelers and if so, what other functions	Yes statistics	8.33%	2	2
do they serve (select all that apply)	Yes, pharmacometrics	29.17%	7	
	Yes, preclinical PK/PD	58.33%	14	
	Yes, clinical pharmacology	41.67%	10	
	Yes, DMPK	45.83%	11	
	Yes, other	8.33%	2	
11. If "yes" is selected for Question 10, please	0-25%	38.10%	8	12
provide the percentage of FTE used to develop	25-50%	38.10%	8	
or apply preclinical QSP models	50-75% 75.100%	9.52%	2	
	Not applicable	4 76%	1	
12. How are OSP modelers in your company	Centralized	41.67%	10	9
organized?	Divided into therapeutic areas	8.33%	2	-
8	Divided into different geographic regions	8.33%	2	
	Other organizational structure	41.67%	10	
13. How do QSP modelers in your company	Direct (modeler is integral part/member of project team)	20.83%	5	9
interact with project teams?	Indirect (modeler provides support only as requested by project team member)	29.17%	7	
	Both, dependent on project or development stage	50.00%	12	
14. How many QSP projects are typically	1	25.00%	6	9
supported simultaneously per (part-time or	2	45.83%	11	
full-time) QSP modeler?	3	20.83%	5	
	4	0.00%	0	
15 At what stopp is OSD modeling symmetry	>4 Toront validation	8.33%	2	10
15. At what stage is QSP modeling currently initiated in your company (select all that	Lead identification	39.13%	5	10
apply)?	Lead intellification	21.74% 43.48%	10	
appry):	Clinical candidate selection (pre-IND)	73.91%	10	
	Clinical development (post-IND)	60.87%	14	
16. Regarding the timing in which preclinical OSP modeling is done, please select all that	Modeling is initiated to facilitate/support preclinical experimental study design	45.83%	11	9
apply.	Modeling is initiated to help interpret and analyze preclinical experimental data in general	83.33%	20	
	Modeling is initiated only when unexpected preclinical experimental results are obtained	20.83%	5	
	Modeling is initiated to facilitate/support planning for First in Human studies	66.67%	16	
	Not applicable (my company does not use preclinical QSP modeling, only clinical)	4.17%	1	
17. How does your company share QSP	As standalone executable tool	20.83%	5	9
models internally/externally (select all that	As open-source code	33.33%	8	
apply)?	As commercial code (e.g., MATLAB script)	62.50%	15	
	As mathematical descriptions	33.33%	8	
	As markup language model (e.g., SBML, CellML)	25.00%	6	
	Other Not applicable (company does not share OSP models)	8.33%	2	
18 If your company's OSP modelers are	We have a shared database of models and data with open access to both	10.07%	4	
divided between preclinical and clinical, how is information shared typically?	preclinical and clinical modelers	0.00%	0	10
	There is an official hand-off of models, data and reports, which ends the involvement of the preclinical modelers	0.00%	0	
	There is a gradual hand-off of models, data and reports, with the preclinical modeler working with the clinical team to keep developing the model for clinical applications	13.04%	3	
	There is no formal process to transfer knowledge from preclinical to clinical	39.13%	9	
	Not applicable (company does not have separate preclinical and clinical QSP modelers)	47.83%	11	

Question	Answers	Responses (%)	# of Responses	# Skipped
19. If there is an official hand-off between	Pre IND/FIH	26.09%	6	10
preclinical and clinical modelers, at what stage	Pre Phase II POC	0.00%	0	
does this occur (select all that apply)?	Post Phase II POC	0.00%	0	
	Not applicable: preclinical and clinical QSP modelers typically work together collaboratively	17.39%	4	
	Not applicable: company does not have separate preclinical and clinical QSP modelers or official hand-off	56.52%	13	
20. Does your company utilize "-omics"	Often	4.17%	1	9
(genomics, transcriptomics, proteomics,	Sometimes	16.67%	4	
metabolomics, physiomics) data in QSP models?	Karely	29.17%	7	
21. Are in-house and/or CRO experiments	Often	8.33%	2	9
specifically designed to support QSP modeling	Sometimes	50.00%	12	
activities (e.g., parameter estimation)?	Rarely	25.00%	6	
22 84 1 64 64 6	Never	16.67%	4	
22. Which of the following software tool/languages do you use for QSP modeling (select all that apply)?	specialized systems biology/physiology/pharmacology toolbox/software or markup languages (e.g., MATLAB® SimBiology®, Entelos PhysioLab®, Immunetrics Biosimulation Platform/Aegis, DBSolveOptimum, JDesigner, Bayer's MoBi®, etc.)	79.17%	19	9
	PBPK software tools (e.g., Simcyp <sup>®</sup> , GastroPlus, Bayer's PK-Sim <sup>®</sup> )	45.83%	11	
	PK/PD modeling tools (e.g., Phoenix® WinNonlin®, Berkeley Madonna, SAAM II, ADAPT 5) Population PK/PD modeling tools (e.g., Phoenix® NLME,	62.50%	15	_
	NONMEM®, Monolix®, etc.)	50.00%	12	
	General engineering, computational or statistical languages/tools (e.g., MATLAB®, Mathematica®/SystemModeler, C/C++, Java, Python®, FORTRAN & SAS®, SPlus®, etc.)	70.83%	17	
	Others	8.33%	2	
	Not Sure	0.00%	0	
23. What type of QSP models does your	Fit-for-purpose models (project specific, focused/pathway specific)	33.33%	8	9
company develop or plan to develop?	Platform models (comprehensive model of a disease/therapeutic area)	0.00%	0	
	Both types of models	62.50%	15	
24 What biological scales are OSP models at	Gene level	8 33%	2	9
your company typically focused on (select all	Pathway level	75.00%	18	/
that apply)?	Organelle level	16.67%	4	
	Cell level	58.33%	14	
	Tissue level	66.67%	16	
	Urgan level Whole body level	83.33%	20	
	Patient populations	62.50%	15	
	Not sure	8.33%	2	
25. How is the quality or reliability of your	Diagnostic plots/statistical tests	50.00%	12	9
preclinical QSP models assessed (select all that	Perform sensitivity analyses	70.83%	17	
apply)?	Utilize uncertainty quantification methodologies	29.17%	20	
	Assessed by other modelers	45.83%	11	
	Evaluated by biological plausibility by non-modelers	70.83%	17	
	None	4.17%	1	
26. How many variables are typical of preclinical QSP models developed at your	< 20	26.09%	6	10
	20-50	21.74%	5	
company?	> 100	21.74%	7	
27. How long does your company typically	1-3 weeks	12.50%	3	9
spend on building a QSP model (select all that	3-6 weeks	20.83%	5	
apply)?	6-12 weeks	29.17%	7	
	3-6 months	37.50%	9	
	0-12 months	37 50%	12 Q	
28. What is your company's typical process for	In-house development from fundamental components	50.00%		9
developing a QSP model (select all that	In-house development based on published models	62.50%	15	
apply)?	External collaborations with academia or others	37.50%	9	
	Contract with CROs	54.17%	13	
	Both internal and external model development	45.83%	11	

29. In pour company, prechancel QP modeling is used for which of the following purposes (select your top 5 answers)?Target identification, sublidition, nor aptimutation50.00% solution12Bonaker identification, sublidition, matakion and profer analyses50.00%1212Choice og decision mailuring moiss here appendic mechanism33.33%8810Address internal or regulatory questions about incospected PK/PD Notices internal or regulatory questions theory incospected PK/PD Notices internal or regulatory questions theory incospected PK/PD Notices in provide mechanism52.50%61Address internal or regulatory questions theory incospected PK/PD Notices incomposation52.50%61Notices internal or regulatory questions theory incospected PK/PD Notices incomposation52.50%61Notices internal or regulatory questions theory incospected PK/PD Notices incomposation50.0%71Notices internal or regulatory questions incomposation50.0%61Notices internal or regulatory questions incomposation50.0%61Notices internal or regulatory questions incomposation50.0%61Notices internal or regulatory questions incomposation50.0%11Notices internal or regulatory questions internal or regulatory questions in the profession	Question	Answers	Responses (%)	# of Responses	# Skipped
andeling is used for which of the following parpoies (select your top 5 answers)? Biomacker identification, quintration and prioritization and further may 5 allows Compared certain making and prioritization and further may 5 allows Compared certain making and prioritization and further may 5 allows Address internal or equatory questions about unexpected PCrPD Educations and the program of the following and the program of the prioritization and the pr	29. In your company, preclinical QSP	Target identification, validation, or optimization	25.00%	6	9
pippose (select your op 5 sitiswers):         Distributed issuin leading, stratument, intrastation and unner analyses         31.20%         1/2           Assess hypotheses for (rathophysiological, toxicological, and/or         70.83%         17           Assess hypotheses for (rathophysiological, toxicological, and/or         70.83%         17           Assess hypotheses for (rathophysiological, toxicological, and/or         70.83%         11           Assess hypotheses for (rathophysiological, toxicological, and/or         70.83%         11           Address internal or regulatory questions ahout unexpected PK/PD         55.00%         6           Address internal or regulatory questions ahout unexpected PK/PD         55.00%         6           Address internal or regulatory questions ahout unexpected PK/PD         50.00%         6           Address internal or regulatory questions and or dose regiment         20.17%         1           Address internal or regulatory questions and regulation incluing pediatrics         20.17%         1           Address internal or regulatory questions         30.10%         2         0           Address internal or regulatory questions         30.10%         2         0           Address internal or regulatory questions         30.00%         12         9           Address internal or regulator regulator regulatory andion regulator regulatory andion regula	modeling is used for which of the following	Compound selection, optimization and prioritization	50.00%	12	
Design preclimical appertnemal atopies         41.67%         10           Assess bypothess for (unphalpybinging), intrological, indicological, indin	purposes (select your top 5 answers)?	Go/no-go decision making	33.33%	8	
Assess hypotheses for (juthophysiological, toxicological, and/or Address internal or regulatory questions about unexpected PK/PD     50.0%     6       Address internal or regulatory questions about unexpected PK/PD     50.0%     6       Compare with competitor compounds     43.8%     11       Compare with competitor compounds     53.0%     6       Optimize clinical PK/Company     50.0%     6       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     51.1%     13       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     51.0%     6       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     51.0%     6       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     50.0%     6       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     50.0%     7       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     60.0%     7       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     7     9       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     7     9       Optimize clinical trail design (nebulang drug biomarker sampling times and patient selection)     7     9       Optimize clinical trail design (neb		Design preclinical experimental studies	41.67%	10	
Address internal or regulatory questions about unexpected PK/PD     25.00%     6       Compare with competitor compounds     45.83%     11       Address questions regarding special population including polarities     25.00%     6       Address questions regarding special population including polarities     25.00%     6       Address questions regarding special population including polarities     53.17%     13       Address questions approved duritiks     54.17%     1       Address questions approved duritiks     54.17%     1       Optimics approved duritiks     54.17%     1       Optimics approved duritiks     54.17%     1       Optimics approved duritiks     54.17%     1       Address internation of polaritiks     54.17%     1       Address duritiks     50.00%     6       Other     4.17%     1       Address duritiks     50.00%     12       Optimic approved duritiks     50.00%     12       Addresses     50.00%     12       Addresse		Assess hypotheses for (patho)physiological, toxicological, and/or therapeutic mechanisms	70.83%	17	
Compare with competitor compounds     45.83%     11       Optimize clinical PCC does and or does regiments     50.00%     12       Address questions regarding special population including poliations     23.00%     6       Optimize approach dargs     54.17%     1       Optimize approach dargs     54.17%     1       System approach dargs     50.00%     6       Optimize approach dargs     50.00%     6       Other     4.17%     1       Addresses description and policial all thrapputic areas     16.67%     4       Optimize approach dargs     50.00%     12     9       What therapeutic area does QSP     Oncology     00.00%     12     9       Addresses     25.00%     6     16     14       Autoimmun disorders     25.00%     6     14       Autoimmun disorders     20.00%     12     9       Autoimmun disorders     20.00%     12     9       Autoimmun disorders     20.00%     12     14       Autoimmun disorders     20.00%     12     9       Autoimmun disorders     20.00%     12 </td <td></td> <td>Address internal or regulatory questions about unexpected PK/PD behaviors</td> <td>25.00%</td> <td>6</td> <td></td>		Address internal or regulatory questions about unexpected PK/PD behaviors	25.00%	6	
2. What is the general view within your conganization (select all that apply)?     Application including conding sequel power application including provide the sequel intervent of the sequel intervent of the sequel intervent optimize general sequel intervent of the se		Compare with competitor compounds	45.83%	11	
Opinizer distingt fring design (schuding drug biomorfer suppling times particles)         2.017%         7           Percher efficacy in clinical trials         54.17%         13           Opinizer approved drugs         54.17%         1           Assess safety/notices)         25.00%         6           Other         4.17%         1           Assess affety/notice)         25.00%         6           Other         4.17%         1           What therapeutic areas in your organization (select all that apply)?         Produly applied, but not in all therapeutic areas         50.00%         12           Oncology         Oncology         0.00%         12         9           Modeling provide the most support in your organization (select all that apply)?         0.00%         12         9           None         1.6.67%         4         1         1           32. What is the general view within your company on the importance/impact of QSP         None         4.17%         1           33. Where QSP has been successful, what have been the main reasons for it bling jndged af uinperclass with timely and sufficient modeling support         6.6.67%         6           34. Where QSP has failed to deliver, what have been the main reasons for it bling jndged af uiner (celert) af finding supported) but iterature and experimental data support of the ling jndged af uinere (celert) af f		Address questions regarding special population including pediatrics	25.00%	12	
Product efficacy in clinical trials         \$4.17%         13           Product efficacy in clinical trials         \$4.17%         1           Suggest companion diagnostics         4.17%         1           30. How would you describe the application of QSP modeling across thempetic areas in you         Applied an all therapeutic areas         16.67%         4         9           30. How would you describe the application of QSP modeling across thempetic areas (SOP)         Oncology         50.00%         12           31. In what therapeutic areas (SOP)         Oncology         50.00%         12         9           modeling provide the most support of your organization (select all that apply)?         Oncology         50.00%         12         9           Autoimmune disorders         50.00%         12         9           Autoimmune disorders         50.00%         12         1           Autoimmune disorders         50.00%         12         1           Cardiovascular         16.67%         4         1           There are a desc (SP)         To any of the importance impact of QSP         50.00%         1           32. What is the general view within your company on the importance impact of QSP         To any of the impacting providers         53.3%         14           33. Where QSP has balse success/like with impl		Optimize clinical trial design (including drug/biomarker sampling times and patient selection)	29.17%	7	
Optimize approved drugs         8.33%         2           30. How would you describe the application of Oxfer         4.17%         1           30. How would you describe the application of Company?         Applied in all therapeutic areas         16.67%         4         9           30. How would you describe the application of Company?         Applied in all therapeutic areas         50.00%         12         9           31. In what therapeutic area does QSP modeling provide the most support in your organization (select all that apply)?         Applied in all therapeutic areas         50.00%         12         9           Metabolic disorders         50.00%         12         9           Metabolic disorders         50.00%         12         9           More         4         9         14         9           Metabolic disorders         50.00%         12         9           More         4         9         14         1           Area diseases         25.00%         6         12         1           The what therapeutic areas         50.00%         12         9         1         1           So there approved thy protein your         Area diseases         25.00%         6         1         1         1           32. What is the general vi		Predict efficacy in clinical trials	54.17%	13	
Suggest companion diagnostics     4.17%     1       30. How would you describe the application of QSF modeling across therapeutic areas in you pollet and interpaptic areas in you pollet and interpaptic areas     16.67%     4     9       30. How would you describe the application of QSF modeling across therapeutic areas in you pollet most supplied, but not in all therapeutic areas     33.33%     8     9       31. In what therapeutic areas does QSP modeling provide the most support in your organization (select all that apply)?     Oncology     50.00%     12     9       Autoimmune disorders     50.00%     6     14       Rare disease     29.17%     7     9       Somewhat important/impactful     58.33%     14     14       None     4.17%     1     1       3.1 The Very important/impactful     58.33%     14     14       Somewhat important/impactful     58.33%     2     17%     1       3.2 Where QSP has failed to deliver, what have been the main reasons for it being judged a fullure (select all that apply)?     16<		Optimize approved drugs	8.33%	2	
Assess sately/forucology         25.00%         6           30. How would you describe the application of QSP modeling cross therapeutic areas in your company?         Applied in all therapeutic areas         16.67%         4         9           31. In what therapeutic area does QSP modeling provide the most support in your organization (select all that apply)?         Oncology         50.00%         12         9           Autoimmune disorders         50.00%         12         1           Autoimmune disorders         25.00%         6         1           Area diseases         29.17%         7         9           Company on the importance/impact of QSP modeling?         None         4.17%         1           30. Where QSP has been successful, what have been the main reasons for it being indged a success (select all that apply)?         Not sure         4.17%         1           34. Where QSP has har failed to deliver, what have been the main reasons for it being indged a failure (select all that apply)?         F         9           35. Has the use of preclinical QSP modeling impacted communication/alignment around todelarget failings on supported by literature and expe		Suggest companion diagnostics	4.17%	1	
30. How would you describe the application of QSF modeling across therapeutic areas applied in all therapeutic areas       1.1/7%       1         30. How would you describe the application of QSF modeling across therapeutic areas application finite to one or two therapeutic areas       3.3.33%       8         31. In what therapeutic area does QSP modeling provide the most support in your organization (select all that apply)?       Neuroscience       16.67%       4         Metabolic disorders       50.00%       12       9         Autoimmune disorders       50.00%       12         The what it for provide the most support in your organization (select all that apply)?       Neuroscience       16.67%       4         Metabolic disorders       25.00%       6       7       7       0         32. What is the general view within your company on the importance/impact of QSP modeling?       Very important/impactful       58.33%       14       7         33. Where QSP has been successful, what have been the main reasons for it being judged a success (select all that apply)?       Inclusion in regulatory documents and regulatory agency interest       25.00%       6         Modeling finding supported by literature and experimental data       54.17%       13       14         Modeling finding supported by literature and experimental data       54.17%       13       14         Modeling finding or expertice)       16.67%		Assess safety/toxicology	25.00%	6	
23. What is the general view within your     Sourdly applied base to a subscription of the probability of the probabilit	30 How would you describe the application of	Applied in all therapeutic areas	4.17%	1	0
20.1. In what herapeutic area does (QSP modeling provide the most support in your organization (select all that apply)?         Application limited to one or two therapeutic areas         50.00%         12           31. In what therapeutic area does (QSP modeling provide the most support in your organization (select all that apply)?         Neuroscience         16.67%         4           32. What is the general view within your company on the importane/impact of QSP modeling?         Neuroscience         29.17%         7           33. What is the general view within your company on the importane/impact of QSP modeling?         Very important/impactful         29.17%         7           33. Where QSP has been successful, what have been the main reasons for it being judged a fullure (select all that apply)?         Impact imp projects with timely and sufficient modeling support         56.05%         16         9           34. Where QSP has been successful, what have been the main reasons for it being judged a fullure (select all that apply)?         Impact imp projects with timely and sufficient modeling support         56.05%         16         9           4. Where QSP has failed to deliver, what have been the main reasons for it being judged a failure (select all that apply)?         Impact imp projects with implate due apperiment al governance meetings         25.00%         6           34. Where QSP has failed to deliver, what have been the main reasons for it being judged a failure (select all that apply)?         Imclusion in requalatory documents and regulatory agence interestiction macters f	OSP modeling across therapeutic areas in your	Broadly applied, but not in all therapeutic areas	33.33%	8	/
31. In what therapeutic area does QSP       Oncology       50.00%       12       9         modeling provide the most support in your       Neuroscience       16.67%       4         Number of the post support in your       Neuroscience       16.67%       4         Metabolic diseases       8.33%       2       2         Cardiovascular       16.67%       4         Metabolic disorders       20.09%       6         S2. What is the general view within your       20.83%       5         company on the importance/impact of QSP       None       4.17%       1         Mote       20.17%       7       9         Somewhat important/impactful       28.33%       14       Not sure         Somewhat important/impactful       8.33%       2       1         Not sure       Somewhat important/impactful       8.33%       1         Not sure       Management or decision maker interest       54.17%       13         success (select all that apply)?       Management or decision maker interest       54.17%       13         Modeling findings supported by literature and experimental data       54.17%       13         Addressing the clearly defined problems within the intended scope       66.67%       16         Addressin	company?	Application limited to one or two therapeutic areas	50.00%	12	
modeling provide the most support in your organization (select all that apply)?       Neuroscience       50.00%       12         Autoinmune disorders       50.00%       6         Infectious diseases       8.33%       2         Cardiovascular       16.67%       4         Metabolic disorders       25.00%       6         Rare diseases       29.17%       7         Other       20.83%       5         None       4.17%       1         Somewhat inportant/impactful       29.17%       7         Somewhat inportant/impactful       8.33%       2         Not supportant/impactful       8.33%       16         success (select all that apply)?       Maagement or decision maker interest       54.17%       13         indecling findings supported by literature and experimental data       54.17%       13         induce (select all that apply)?	31. In what therapeutic area does QSP	Oncology	50.00%	12	9
organization (select all that apply)?     Autommune disorders     50.00%     12       Infections diseases     8.33%     2       Cardiovascular     16.67%     4       Metabolic disorders     20.91%     7       Other     20.83%     5       company on the importance/impact of QSP     Somewhat important/impactful     29.17%     7       32. What is the general view within your company on the importance/impact of QSP     Somewhat important/impactful     58.33%     14       33. Where QSP has been successful, what have been the main reasons for it being judged a success (select all that apply)?     Impacting projects with timely and sufficient modeling support     66.67%     16     9       Management or decision maker interest     54.17%     13     1       Model development vialidation/uncertainty well performed or docision maker interest     54.17%     13       Model development vialidation/uncertainty well performed or docision maker interest     56.52%     13       34. Where QSP has failed to deliver, what have been the main reasons for it being judged a failure (select all that apply)?     Feelinical QSP work typically get presented at governance meetings     55.05%     16       34. Where QSP has failed to deliver, what have been the main reasons for it being judged a failure (select all that apply)?     Feelinical QSP work typically get presented at governance meetings     55.05%     13     10       35. Has	modeling provide the most support in your	Neuroscience	16.67%	4	
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32. What is the generative work importance/impact of QSP       Yey importance/impact       25.17%       7       9         33. Where QSP has been successful, what have been the main reasons for it being judged a success (select all that apply)?       Impacting projects with timely and sufficient modeling support       66.67%       16       9         Mote success (select all that apply)?       Impacting projects with timely and sufficient modeling support       56.67%       16       9         Model development/validation/uncertainty well performed or documented       54.17%       13       13         Addressing the clearly defined problems within the intended scope for sources, including funding or expertise)       66.67%       16         34. Where QSP has failed to deliver, what have been the main reasons for it being judged a failure (select all that apply)?       Tot interest from management or internal decision makers       56.52%       13       10         35. Has the use of preclinical QSP modeling impacted communication/alignment around biological concepts within project teams?       76.52%       13       10         36. When was preclinical QSP first explored in your company?       Yes, it has had a positive impact on team communication/alignment       66.67%       16       9         Yes, it has had a positive impact on team communication/alignment around biological concepts within project teams?       56.52%       13       10         35. Has the use of preclinical QSP model	22 What is the general view within your	None	4.17%	1	0
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Not addressing clearly defined problems within the intended scope47.83%1135. Has the use of preclinical QSP modeling impacted communication/alignment around biological concepts within project teams?Yes, it has had a positive impact on team communication/alignment66.67%1697Yes, it has had a negative impact on team communication/alignment0.00%0008No, QSP modeling has not influenced team communication/alignment33.33%80036. When was preclinical QSP first explored in your company?Before 20058.33%2992005-20102016-201550.00%122016-20162016-20162016-20162016-20162016-201616.67%4937. How many projects does QSP significantly impact per year?01-229.17%7123-429.17%73 - 45 - 1029.17%729.17%711 <t< td=""><td></td><td>documented</td><td>17.39%</td><td>4</td><td></td></t<>		documented	17.39%	4	
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Impact of communication angline in dotting biological concepts within project teams?Too, QSP modeling has not influenced team communication/alignment33.33%336. When was preclinical QSP first explored in your company?Before 20058.33%292005-201025.00%62016 - present16.67%437. How many projects does QSP significantly impact per year?016.67%491 - 229.17%73 - 412.50%35 - 1029.17%7	impacted communication/alignment around	Yes, it has had a positive impact on team communication/alignment	0.07%	0	9
36. When was preclinical QSP first explored in your company?       Before 2005       8.33%       2       9         2005-2010       25.00%       6         2011-2015       50.00%       12         2016 - present       16.67%       4         37. How many projects does QSP significantly impact per year?       0       16.67%       4       9         1 - 2       29.17%       7       3 - 4       12.50%       3         5 - 10       29.17%       7       7	biological concepts within project teams?	No, QSP modeling has not influenced team communication/alignment	33.33%	8	
your company?         2005-2010         25.00%         6           2011-2015         50.00%         12           2016 - present         16.67%         4           37. How many projects does QSP significantly impact per year?         0         16.67%         4         9           1 - 2         29.17%         7         3         4         9           5 - 10         29.17%         7         3         4         9	36. When was preclinical QSP first explored in	Before 2005	8.33%	2	9
2011-2015         50.00%         12           2016 - present         16.67%         4           37. How many projects does QSP significantly impact per year?         0         16.67%         4         9           1 - 2         29.17%         7         3         4         9           5 - 10         29.17%         7         3         4         9	your company?	2005-2010	25.00%	6	
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3 - 4     12.50%     3       5 - 10     29.17%     7	impact per vear?	1 - 2	29.17%	4	9
5 - 10 29.17% 7	por Jour .	3 - 4	12.50%	3	
		5 - 10	29.17%	7	
>10 12.50% 3		>10	12.50%	3	
38. Does QSP work make it into regulatory     Frequently     16.67%     4     9       submission documents?     Comptimum     2	38. Does QSP work make it into regulatory	Frequently	16.67%	4	9
submission documents? Sometimes 8.35% 2 Paraly 20 170% 7	submission documents?	Sometimes Parely	8.53%	2	
Never 45.83% 11		Never	45.83%	11	

Question	Answers	Responses (%)	# of Responses	# Skipped
39 If OSP is included in regulatory	As sole supporting evidence	4.17%	1	9
documents, how is it used (select all that	Supporting Human Efficacious Dose prediction	66.67%	16	-
apply)?	Supporting safety assessment	29.17%	7	
	Proposing a registration (trial) dose	20.83%	5	
	To support other arguments	33.33%	8	
	Not applicable	33.33%	8	
40. At your company, how do you anticipate	Increasing	58.33%	14	9
the number of QSP modelers changing over	Stable	37.50%	9	
the next two years?	Decreasing	4.17%	1	
41. Within the next five years, in what	Oncology	62.50%	15	9
therapeutic area do you anticipate the most	Neuroscience	33.33%	8	
potential for QSP modeling impact in your	Autoimmune disorders	62.50%	15	
organization (select all that apply)?	Infectious diseases	12.50%	3	
	Cardiovascular	25.00%	6	
	Metabolic disorders	25.00%	6	
	Rare diseases	29.17%	7	
	Other	29.17%	7	
	None	0.00%	0	
42. What cross-functional training	Mathematics, statistics, engineering, or physics concepts (e.g., nonlinear	15 83%	11	9
opportunities are planned for all modelers	dynamics, control theory, etc.)	45.85%	11	2
(including QSP modelers, PKPD modelers,	Relevant biological/physiological/pathological pharmacological systems	58.33%	14	
statisticians, etc. ) in your organization (please	Soft skills such as communication, project management, leadership, etc.	58.33%	14	
select up to 5 answers)?	Systems biology/physiology, PBPK/PD, pop PK/PD	62.50%	15	
	General ODE- or PDE-based computational modeling concepts	29.17%	7	
	Other types of computational models (e.g., (fuzzy) logic models, agent- based models, etc.)	4.17%	1	
	Information on "big data" or machine learning methods (e.g., Bayesian networks, artificial neural networks, deep learning, support vector machines, clustering)	16.67%	4	
	Coding languages or software development	33.33%	8	
	Optimization/calibration/verification techniques for complex systems	12.50%	3	
	In vivo or in vitro experimental skills	4.17%	1	
	Other	4.17%	1	
	Not sure	12.50%	3	
	None	0.00%	0	

Response (%) =  $100\% \times [\# \text{ of Responses}] \div (33 - [\# \text{ Skipped}])$ , where 33 is the total number of survey participants. In other words, "Responses (%)" are calculated based on the number of responses divided by the number of responders to any given question.