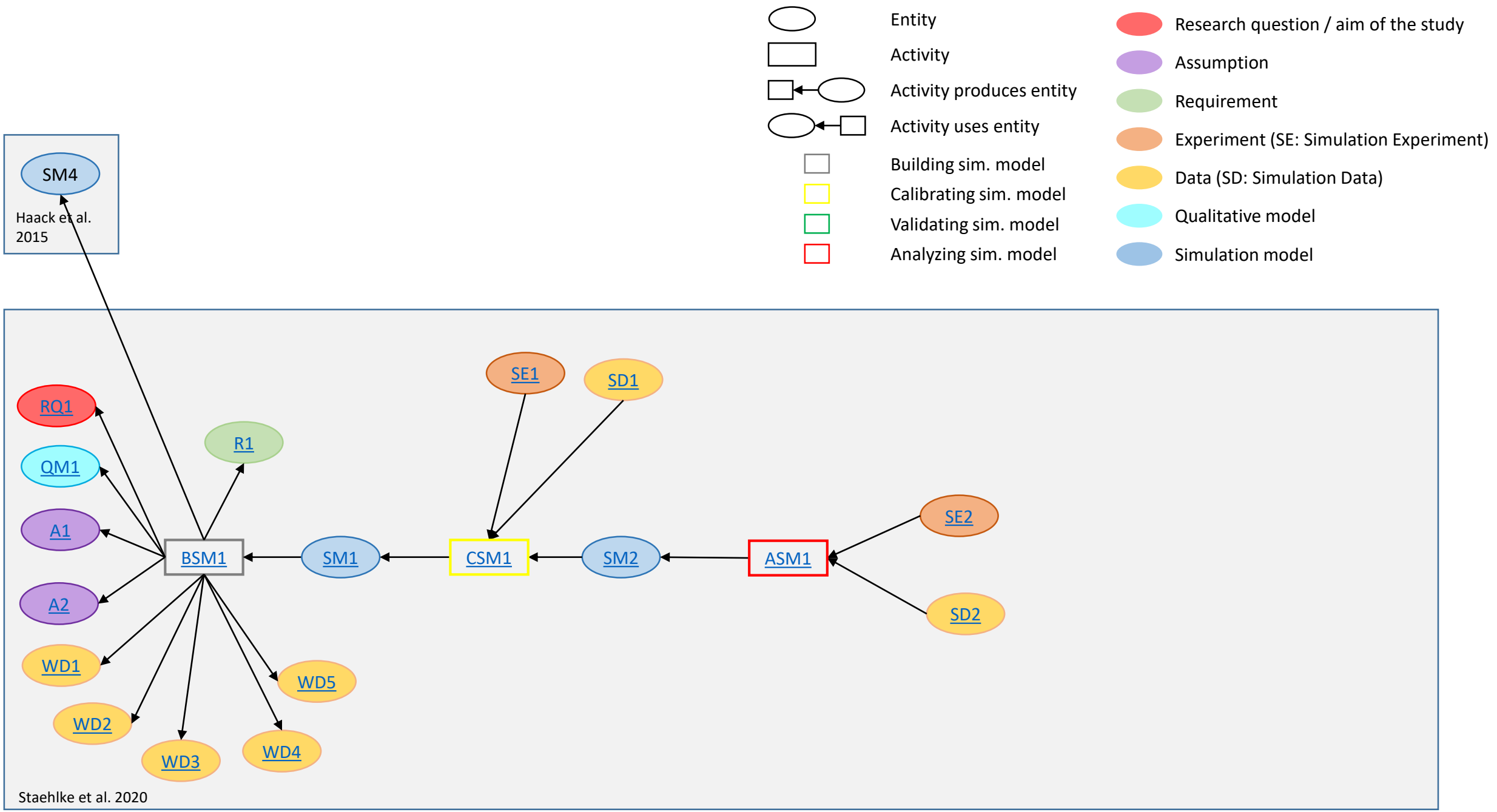
Entity
Activity
Activity produces entity
Activity uses entity
Building sim. model
Calibrating sim. model
Validating sim. model
Analyzing sim. model
Research question / aim of the study
Assumption
Requirement
Experiment (SE: Simulation Experiment)
Data (SD: Simulation Data)
Qualitative model
Simulation model
SM4
Haack et al. 2015
RQ1
QM1
A1
A2
WD1
WD2
WD3
WD4
WD5
R1
BSM1
SM1
SE1
SD1
CSM1
SM2
ASM1
SE2
SD2
Staehlke et al. 2020

RQ1 Research question

Type	Label
Description	“influence of edges and ridges on the Wnt/β-catenin pathway in combination with the cells’ stress response”
Study	Staehlke et al. 2020

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QM1 Qualitative model

Type	Label
Description	“Schematic representation of the implemented model of the Wnt-independent β-catenin”
Reference	Figure 7
Species	Axin, β-catenin, Dvl, ICAT, Nrx, ROS, SOX17, TCF
Compartments	Cytosol, endosome
Study	Staehlke et al. 2020

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A1 Assumption

Type	Label
Description	“no extracellular Wnt stimulus”
Category	Omitted process (397)
Study	Staehlke et al. 2020

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A2 Assumption

Type	Label
Description	“homologues AXIN and AXIN2 are both considered as AXIN in the model”
Category	Equivalence (392)
Study	Staehlke et al. 2020

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WD1 Data

Type	Label
Description	“β-catenin protein expression and localization in MG-63 osteoblasts on micro-pillars (P5)”
Reference	Figure 1
Type of experiment	In vitro
Organism	Human
Cell line	Osteoblast-like human cells MG-63
Study	Staehlke et al. 2020

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WD2 Data

Type	Label
Description	“Gene expression profiling of MG-63 cells on micro-pillars (P5) compared to unstructured reference (Ref)”
Reference	Figure 2
Type of experiment	In vitro
Organism	Human
Cell line	Osteoblast-like human cells MG-63
Study	Staehlke et al. 2020

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WD3 Data

Type	Label
Description	“β-catenin inhibitors ICAT (inhibitor of β-catenin and TCF-4) and SOX17 (SRY-box transcription factor 17) in MG-63s on micro-pillars (P5) versus unstructured Ref after 24 h.”
Reference	Figure 4
Type of experiment	In vitro
Organism	Human
Cell line	Osteoblast-like human cells MG-63
Study	Staehlke et al. 2020

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WD4 Data

Type	Label
Description	“Quantification of the osteoblastic markers bone sialo protein-2 (BSP-2), collagen type I (Col1), fibronectin (FN), osteocalcin (OCN) and osteopontin (OPN) in MG-63s grown on micro-pillars (P5) or unstructured reference (Ref) for 96 h.”
Reference	Figure 5
Type of experiment	In vitro
Organism	Human
Cell line	Osteoblast-like human cells MG-63
Study	Staehlke et al. 2020

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WD5 Data

Type	Label
Description	“Reactive oxygen species (ROS) generation and lipid peroxidation in MG-63s on micro-pillars (P5) after 24 h”
Reference	Figure 6
Type of experiment	In vitro
Organism	Human
Cell line	Osteoblast-like human cells MG-63
Study	Staehlke et al. 2020

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R1 Requirement

Type	Label
Description	“taken together, MG-63 cells on P5 indicated an activated state of the Wnt/β-catenin pathway due to the accumulation of the key effector β-catenin in the cytosol and their transduction in the nucleus after 24 h”
Related to	WD1
Main species	β-catenin
Type	Qualitative
Study	Staehlke et al. 2020

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BSM1 Building simulation model

Type	Label
Description	Reducing and expanding simulation model by Haack et al. 2015
Study	Staehlke et al. 2020

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SM1 Simulation model

Type	Label
Description	Validated Wnt model with ROS (Haack et al. 2015) without membrane-associated signaling components but with intracellular components that are differentially expressed on P5 (ICAT, SOX17 and TCF)
Reference	Not available
Study	Staehlke et al. 2020

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CSM1 Calibrating simulation model

Type	Label
Description	Calibrating simulation model
Study	Staehlke et al. 2020

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SE1 Simulation Experiment

Type	Label
Description	“applied fitting (…) to obtain the corresponding dynamics (of ICAT and SOX17 and their regulatory mechanisms)”
Reference	Not available
Category	Optimization
Study	Staehlke et al. 2020

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SD1 Simulation Data

Type	Label
Description	Simulation results of SE1
Reference	Not available
Related to	SE1
Study	Staehlke et al. 2020

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SM2 Simulation model

Type	Label
Description	Calibrated simulation model
Reference	https://github.com/SFB-ELAINE/SI_Staehlke_MDPI_Cells/blob/master/Model/Model_publication.mlrj
Study	Staehlke et al. 2020

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ASM1 Analyzing simulation model

Type	Label
Description	Analysis of simulation model
Study	Staehlke et al. 2020

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SE2 Simulation Experiment

Type	Label
Description	“Simulation result of the fitted model showing the concentration fold change of total β-catenin (blue) and AXIN expression (red) on (A) P5, and (B) Ref”
Reference	https://github.com/SFB-ELAINE/SI_Staehlke_MDPI_Cells/tree/master/Experiments
Category	Time course analysis
Study	Staehlke et al. 2020

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SD2 Simulation Data

Type	Label
Description	Simulation results of SE2
Reference	Figure 8
Related to	SE1
Study	Staehlke et al. 2020

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