



University of Stuttgart

Stuttgart Research Center Systems Biology (SRC SB)

Systems Biology Seminar Talk

„Proliferation-quiescence
control in normal and drug-
treated cancer cells “

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**Thursday
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4 p.m. – 5 p.m.**

Log in:

<https://unistuttgart.weebx.com/unistuttgart/j.php?MTID=m76345d2b782614306de3d67a9a096a>

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Abstract:

How do mammalian cells make the choice between proliferation (cell-cycle progression) and quiescence (cell-cycle exit)? Correct execution of the proliferation-quiescence decision is important in many biological settings, from developmental processes to adult tissue homeostasis, and dysregulation of this decision occurs in nearly all cancer types. Yet despite clear medical relevance, we have a limited understanding of the inputs that control the choice between proliferation and quiescence, when during the cell cycle cells integrate the presence or absence of these inputs, and how cancer cells rapidly rewire this program to escape targeted cancer therapies. To tackle these issues, my lab has developed cutting-edge experimental and computational methods, including novel fluorescent biosensors, multi-day time-lapse microscopy, and automated single-cell tracking, providing us a longitudinal, multigenerational view of cell-cycle behavior. In this seminar, I will cover the following recent findings from my lab: 1) Human cell cultures contain spontaneously quiescent subpopulations that are triggered by internal cell stress and are resistant to certain drug treatments; 2) Growth factor signaling is integrated throughout the entire mother cell cycle to control daughter cell proliferation; 3) Melanoma cells can rapidly escape drug-induced quiescence and in doing so incur DNA damage.

CV:

Sabrina earned her PhD in Computational and Systems Biology from MIT in 2009. During her PhD, she worked in Peter Sorger's lab on non-genetic origins of cell-to-cell variability in apoptosis. She then pursued postdoctoral studies in Tobias Meyer's lab at Stanford University where she explored the molecular basis of the restriction point using live-cell microscopy. In August 2014, Sabrina became an Assistant Professor at the University of Colorado - Boulder. In 2016, Sabrina was named a Searle Scholar, a Kimmel Scholar, and a Beckman Young Investigator, in 2017, a Pew-Stewart Scholar, and in 2018, an American Cancer Society Research Scholar and an NIH Director's New Innovator.