

**Mentor-Postdoc Spotlight Series 2019**



**Roy Dar Ph.D.**

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Dr. Roy Dar's research career started with a PhD from the University of Tennessee under the guidance of Dr. Michael Simpson. After completing his doctorate in Physics at the University of Tennessee, Roy Dar studied the structure of transcriptional bursts across the human genome and developed a novel drug screen for measuring modulation of noise in gene expression for biasing viral decision-making of HIV. Dr. Roy Dar did his postdoctoral studies under the mentorship of Dr. Leor Weinberger at the Gladstone Institutes of Virology and Immunology (GIVI), Gladstone Institutes, UCSF, where he focused on HIV regulation and decision-making. Their work determined: **1.** Modulation of HIV Tat positive autoregulation biases viral reactivation from latency, **2.** Structure and modulation of transcriptional bursts across the human genome, and **3.** Small molecule modulation of noise in HIV gene expression for synergizing reactivation from latency.

Dr. Roy Dar continued to focus on cellular decision-making and gene expression noise after starting his own laboratory, expanding approaches to include fine-tuning of noise by modulating nucleosome occupancy and the direct single-cell observation that HIV latent decision-making is cell-size dependent. These research efforts have been in collaboration with his postdoctoral trainee Dr. Kathrin Bohn-Wippert.

Some of the research in pursued in Dr. Dar's lab include:

- 1.** Noise modulating drug cocktails to synergize stochastic viral decision-making,
- 2.** promoter similarity and co-expression drives an HIV-host reactivation-migration coupling,
- 3.** fine-tuning of gene expression noise of a viral promoter by nucleosome remodeling, and
- 4.** cell size dependent increases of gene expression bursts limit viral reactivation to larger host cells.

Notable publications from Dr. Dar's research interests are:

1. LS Weinberger\*, RD Dar\*, and ML Simpson (2008) **Transient mediated fate-determination in a transcriptional circuit of HIV.** [\*Nature Genetics\* 40:466–470.](#)

2. RD Dar\*, BS Razooky\*, A Singh, TV Trimeloni, JM McCollum, CD Cox, ML Simpson, and LS Weinberger (2012) **Transcriptional burst frequency and burst size are equally modulated across the human genome.** *Proc Na. Acad Sc.* USA 109:17454–17459
3. RD Dar, NN Hosmane, MR Arkin, RF Siliciano, and LS Weinberger (2014) **Screening for noise in gene expression identifies drug synergies.** *Science* 44:1392–1396.
4. MR Megaridis\*, Y Lu\*, EN Tevonian, KM Junger, JM Moy, K Bohn-Wippert, and RD Dar (2018) **Fine-tuning of noise in gene expression with nucleosome remodeling.** *APL Bioengineering* 2:026106.
5. K Bohn-Wippert\*, EN Tevonian\*, Y Lu, M-Y Huang, MR Megaridis, and RD Dar (2018) **Cell size-based decision-making of a viral gene circuit.** *Cell Reports* 25:3844-3857.

Dr. Dar feels that a close mentorship to his postdocs is very important in order to support and strengthen their education and scientific development. His key advice to current and future postdocs: ***“Choose your postdoc wisely as it is a beautiful stage of self-fulfillment and development in which you spend tremendous amount of time and effort focusing on a specialized topic.”***

Check out the lab’s webpage: <http://dar.bioengineering.illinois.edu>



Dr. Kathrin Bohn-Wippert obtained her PhD from the Friedrich-Schiller-University in Jena, Germany in 2012 under the mentorship of Dr. Andreas Sauerbri. Her doctoral thesis focused on the topic *“Investigation of phenotypic and genotypic resistance of HSV”*. Afterwards, Dr. Kathrin Bohn-Wippert worked as a Research Scientist at the Institute of Virology and Antiviral Therapy, a part of the Friedrich-Schiller-University hospital, in Jena. After 3 years of research experience, Dr. Kathrin Bohn-Wippert moved to the United States and joined the Dar lab at the University of Illinois at Urbana-Champaign.

With over 8 years of research experience, Dr. Kathrin Bohn-Wippert has 16 publications in renowned journals, two of them are book chapters.

You can read Bohn-Wippert and Dar’s latest research [article](#) titled ***“Cell size dependent migration of T-cells latently infected with HIV”*** published in the March 2020 issue of *JoLS*.