MÁRTON SIMON CZIKKELY



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RESEARCH AREA

His research focuses on the evolution of antibiotic resistance and the development of genome engineering methods. His work emphasizes the understanding and prediction of resistance mechanisms in clinically relevant bacteria, particularly ESKAPE pathogens. His research highlights how novel antibiotic candidates can drive multidrug resistance, and how resistant strains alter their virulence traits. Also, he investigates how bacterial stress responses accelerate the evolution of resistance.

TECHNIQUES AVAILABLE IN THE LAB

- · Bacterial genome engineering
- Antibiotic resistance evolution studies
- In vivo virulence studies in a Galleria mellonella larvae model
- Analysis of bacterial stress response

SELECTED PUBLICATIONS

Maharramov, E., **Czikkely**, **M.S.** (2025) Exploring the principles behind antibiotics with limited resistance. **Nat Commun 16:** 1842.

Daruka, L., **Czikkely, M.S.** (2025) ESKAPE pathogens rapidly develop resistance against antibiotics in development in vitro. **Nat Microbiol** 1–19.

Martins, A., Judák, F., **Czikkely**, **M.S.** (2025) Antibiotic candidates for Gram-positive bacterial infections induce multidrug resistance. **Sci Transl Med 17:** eadl2103.

Jangir, P.K., Ogunlana, L., **Czikkely, M.S.** (2023) The evolution of colistin resistance increases bacterial resistance to host antimicrobial peptides and virulence. **eLife 12:** e84395.

Durcik, M., Cotman, A. E., **Czikkely, M.** (2023) New Dual Inhibitors of Bacterial Topoisomerases with Broad-Spectrum Antibacterial Activity and In Vivo Efficacy against Vancomycin-Intermediate Staphylococcus aureus. **J Med Chem 66:** 3968–3994.

Wannier, T.M., Nyerges, A., **Czikkely, M.** (2020) Improved bacterial recombineering by parallelized protein discovery. **PNAS 117:** 13689-13698.

Szili, P., Draskovits, G., **Czikkely, M.S.** (2019) Rapid evolution of reduced susceptibility against a balanced dual-targeting antibiotic through stepping-stone mutations. **Antimicrob Agents Chemother 63(9):** 10-1128.