

Jane X. Kelly, Research Professor. Medicinal/Biophysical Chemistry; Drug discovery and development, drug combination therapy, mechanism and function of antiparasitic agents, drug-drug interactions, multi-drug resistance.

Dr. Jane X. Kelly

Research Professor

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Research

Millions die each year from malaria, a parasitic disease that has plagued mankind for centuries. The demoralizing impact of the disease in modern time extends to affect the social structure and sustained poverty in endemic areas. Our research focuses on the discovery and development of affordable and safe drugs for treatment and prevention of malaria, with the overarching goal of building synergistic tools to help eradicate the disease on a worldwide scale. Through innovative design to combat multi-drug resistance, our projects aim to expand, enhance, and sustain effective drug combinations. With local and worldwide collaborations, we study the chemical, molecular, and cellular basis of drug action and drug resistance using multidisciplinary techniques and methods. The obtained basic science knowledge is then implemented into the rational design of novel chemotherapeutic/chemoprophylactic agents, and in improving the drug potential of existing antimalarial agents.

Representative Publications

Kelly, J.X., Smilkstein, M.J., Brun, R., Wittlin, S., Cooper, R.A., Lane, K.D., Janowsky, A., Johnson, R.A., Dodean, R.A., Winter, R., Hinrichs, D.J., Riscoe, M.K. (2009) Discovery of dual function acridones as a new antimalarial chemotype. *Nature*. 459: 270-273.

Winter RW, Kelly J.X., Smilkstein M.J., Dodean R., Hinrichs D., Riscoe M.K. (2008) Antimalarial quinolones: Synthesis, potency, and mechanistic studies. *Exp Parasitol*. 118(4):487-97.

Smilkstein, M.J., Forquer, I., Kanazawa, A., Kelly, J.X., Winter, R.W., Hinrichs, D.J., Kramer, D.M., Riscoe, M.K. (2008) A drug-selected *Plasmodium falciparum* lacking the need for conventional electron transport, *Mol Biochem Parasitol*, 159:64-8.

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Kelly, J.X., Winter, R. W., Braun, T. P., Osei-Agyemang, M., Hinrichs, D.J., Riscoe, M.K. (2007) Selective killing of the human malaria parasite *Plasmodium falciparum* by a benzylthiazolium dye. *Exp Parasitol*. 116(2), 103-10.

Burgess, S., Selzer, A., Kelly, J.K., Smilkstein, M., Riscoe, M.K., Peyton, D.H. (2006) A Chloroquine-like molecule, designed to reverse resistance in *Plasmodium falciparum* malaria. *J. Med. Chem.* 49, 5623-5625.

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Sriwilaijaroen N, Kelly J.X., Riscoe M.K., Wilairat P. (2004) Cyquant cell proliferation assay as a fluorescence-based method for in vitro screening of antimalarial activity. *Southeast Asian J Trop Med Public Health.* 35(4):840-4.

Kelly, J.X., Ignatushchenko, M.V., Bouwer, H.G., Peyton, D.H., Hinrichs, D.J., Winter, R.W., Riscoe, M.K. (2003) Antileishmanial drug development: exploitation of parasite heme dependency. *Mol Biochem Parasitol*, 126, 43-49.

Kelly, J.X., Winter, R., Peyton, D.H., Hinrichs, D.J. and Riscoe, M. (2002) Optimization of xanthenes for antimalarial activity: the 3,6-bis- -diethylaminoalkoxyxanthone series. *Antimicrob Agents Chemother*, 46, 144-150.

Kelly, J.X., Winter, R.W., Cornea, A., Peyton, D.H., Hinrichs, D.J. and Riscoe, M.K. (2002) The kinetics of uptake and accumulation of 3,6-bis- -diethylamino-amyloxyxanthone by the human malaria parasite *Plasmodium falciparum*. *Mol Biochem Parasitol*, 123, 47-54.

Kelly, J.X., Winter, R., Riscoe, M.K., Peyton, D.H. (2001) A spectroscopic investigation of the binding interactions between 4,5-dihydroxyxanthone and heme. *J Inorg Biochem*, 86, 617-625.