



# Multiphoton Chemical Imaging to Assess Dermal Pharmacokinetics and Pharmacodynamics

Conor L. Evans

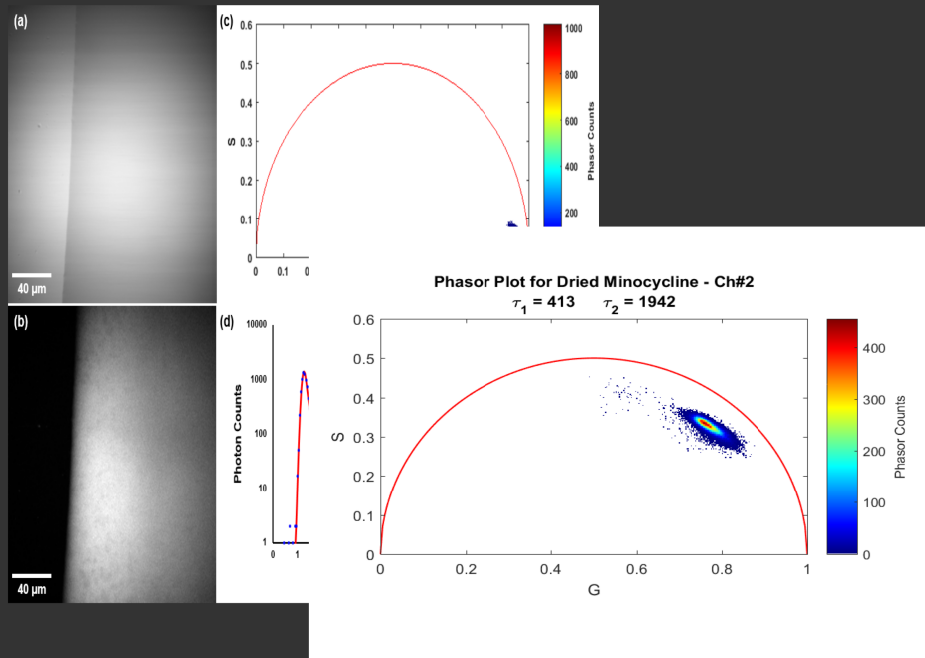
Wellman Center for Photomedicine  
Massachusetts General Hospital  
Harvard Medical School

# Conflict of Interest

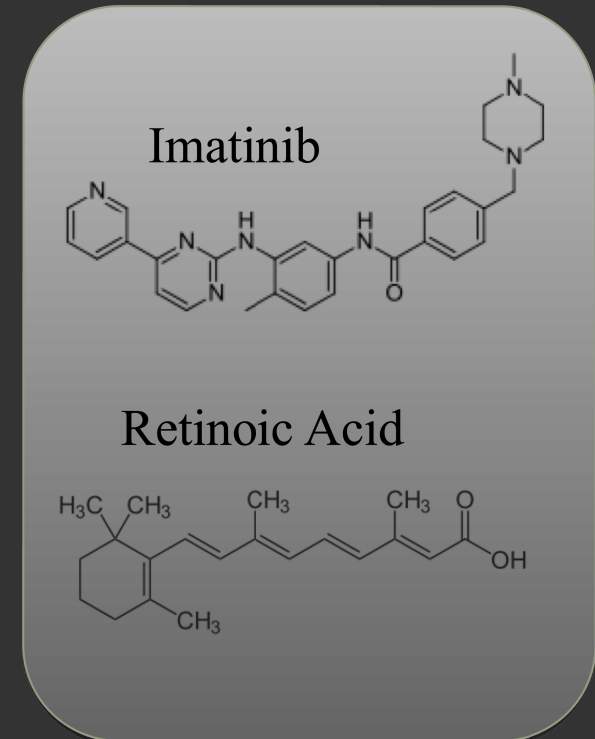
I hold patents on technologies related to Coherent Raman Imaging that have been licensed to both Leica and Zeiss

# Pharmacokinetic Tomography

A paradigm for the microscopic imaging and quantification of drugs based on *intrinsic* sources of contrast:

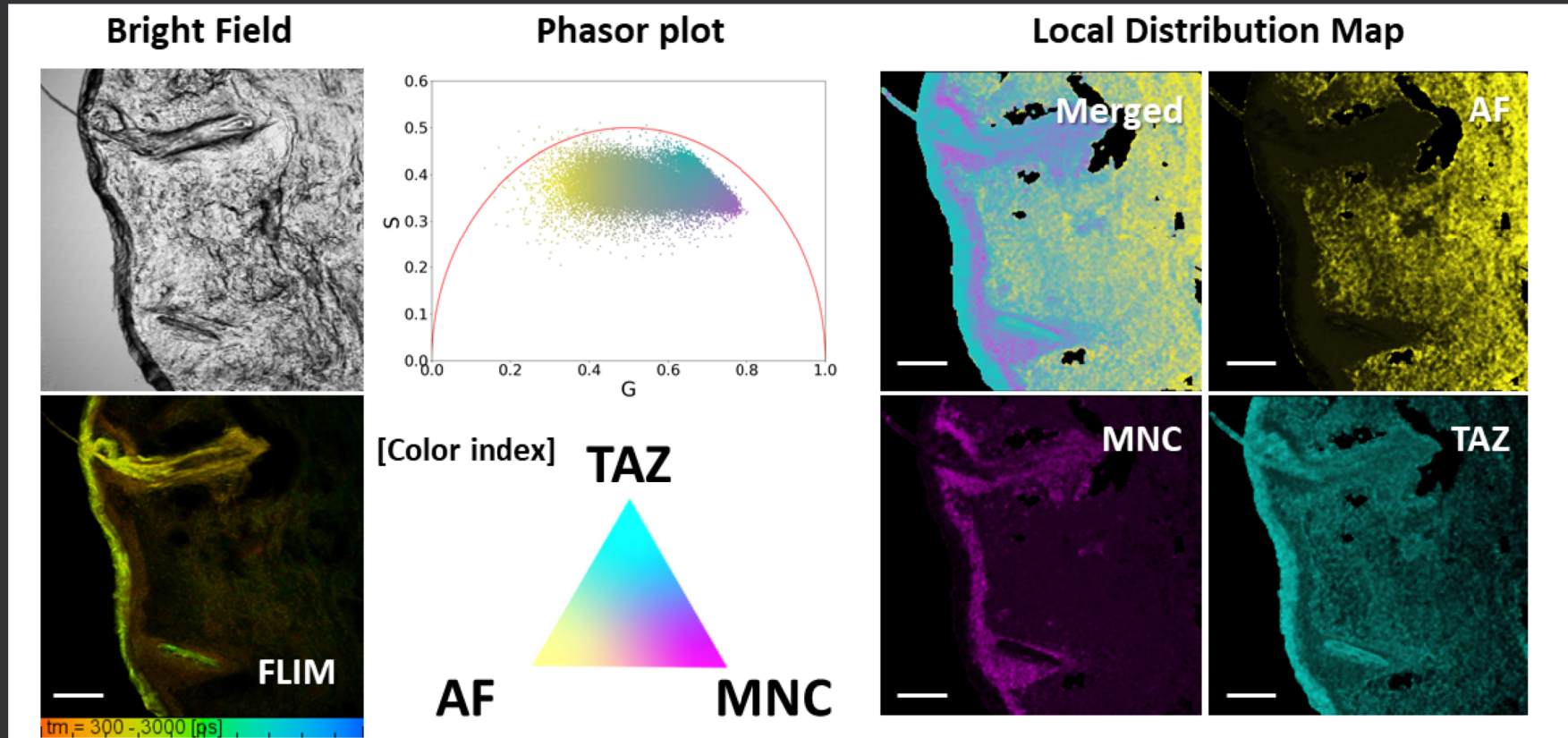


Fluorescence  
Intensity/Lifetime



Molecular Vibrations

# Separating and Quantifying Multiple Drugs using FLIM and Modified Phasor Analysis

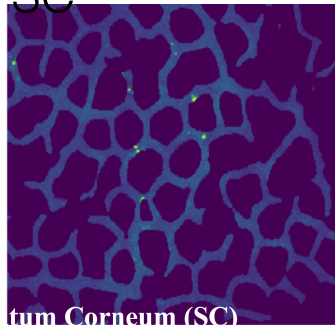




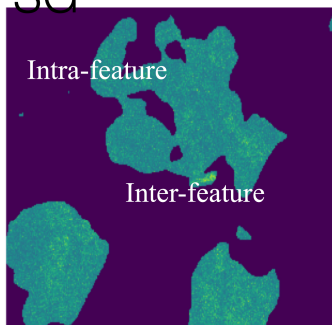
# CRS Follows Drug Diffusion Through Skin Compartments

4 different layers of mouse skin. Drug: Ruxolitinib, Vehicle: Transcutol

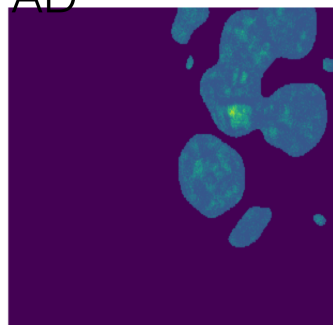
SC



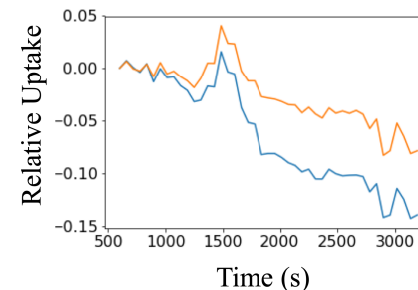
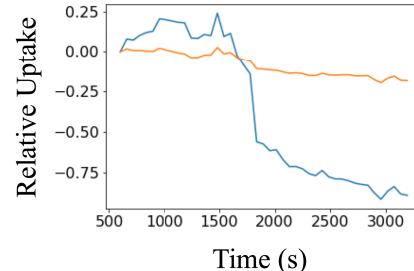
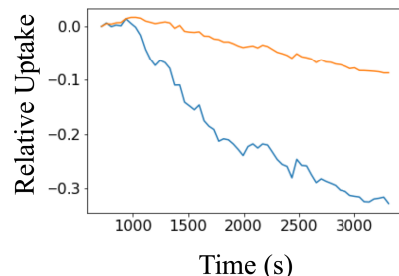
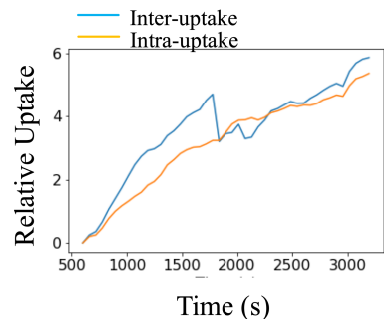
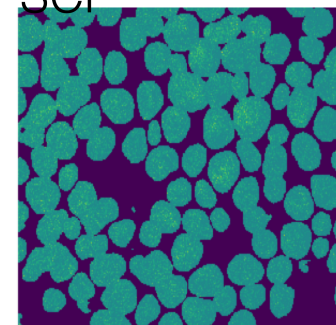
SG



AD



SCF



PK profiles show that primary route of entry is through the hair follicle and sebaceous gland when ruxolitinib is administered in transcutol

Can observe the downward “wave” of the drug at the  $t_{max}$  peaks in the AD and SCF