“Super-resolution Imaging of the Transcription and Translation Machinery in Live *E. coli*”

The new super-resolution fluorescence methods enable location and tracking of specific biomolecules in live cells, providing spatiotemporal information at an unprecedented level of detail. We have located and tracked single ribosomes (chromosomally expressed S2-mEos2), RNA polymerase copies (chromosomally expressed b’-mEos2), HU-mEos2 (from a plasmid), and DNA loci (ParB-XFP labeling) in live *E. coli* with spatial accuracy of s ~ 30 nm. Ribosome-RNAP segregation is strong, arguing against co-transcriptional translation as the primary means of protein synthesis. Diffusion of both ribosomes and RNAP is heterogeneous, enabling us to distinguish translating 70S ribosomes from 30S copies searching for translation initiation sites and transcribing RNAP copies from those searching for transcription initiation sites. In fast growth conditions, the transverse distribution of transcribing RNAP copies is substantially wider than that of HU-mEos2, suggesting that *rrn* operons preferentially locate near the nucleoid periphery.

Thursday
Sept. 12, 2013
12:15 pm
1315 Chemistry

Joint Analytical & ChemBio Seminar

Prof. Jim Weisshaar

UW-Madison Chemistry Dept.