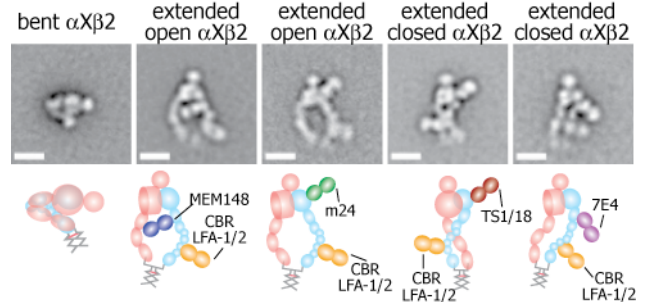




# Research Opportunities in the Springer Lu Lab

## Structural Biology of Integrins

LFA-1, Mac-1,  $\alpha_x\beta_2$ , their ligands and drugs  
 $\alpha_{IIb}\beta_3$ , fibrinogen, fibronectin  
 $\alpha_4\beta_1$ ,  $\alpha_4\beta_7$ , MAdCAM-1, and VCAM-1  
 $\alpha_v\beta_6$ ,  $\alpha_v\beta_6$ , and latent TGF- $\beta$   
Signal transmission in integrin ectodomains

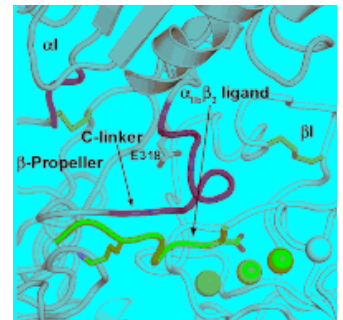
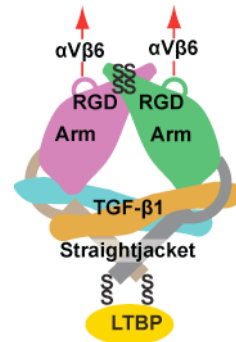


## Structural Biology of TGF- $\beta$ and BMP Family Activation

Structures of BMP family members and their interactors  
Association between the BMP prodomain and fibrillin  
Regulation of BMP activation

## Cell Biology of Integrin Activation

Fluorescence microscopy of integrin activation in intact cells  
Tests of the lateral force hypothesis of integrin activation  
Fluorescent localization of cellular integrin interactors  
Visualization of TGF- $\beta$  activation by integrins

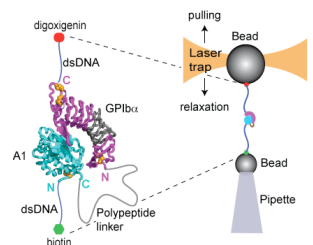
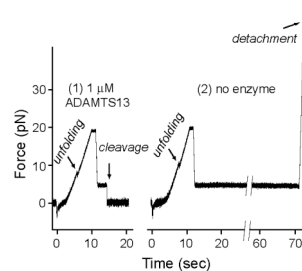


## In vivo function of TGF- $\beta$

Knock-outs of GARP  
Function of cell surface TGF- $\beta$   
Sources of TGF- $\beta$  in immune cell regulation

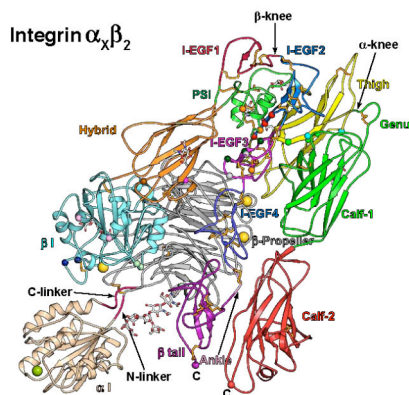
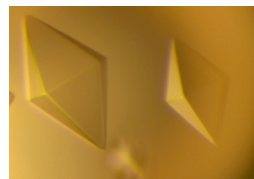
## Single Molecule Studies of Mechanobiology

Effect of elongational flow on von Willebrand Factor  
Force as an allosteric effector  
States of adhesion molecules regulated by applied force  
Microsecond molecular dynamics of allostery



## Structure and Function of von Willebrand Factor

Crystal structures of component domains  
Structural basis for binding to factor VIII



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