

Title of research: **Serine Proteases in Blood Coagulation and Bone**

Research description: Our laboratory is involved in studying the role of serine proteases in blood coagulation and bone formation/remodeling. We employ molecular biology, protein purification, tissue culture, bacterial expression, biochemical characterization, and crystallography in our studies. Our laboratory investigations address 4 main aims: Aim 1, to examine the role of metal cations, Na<sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, and Zn<sup>2+</sup>, in serine proteases and blood clotting. Aim 2, to study the specific residues involved in binding of a serine protease to its respective cofactor and the allosteric changes that occur. Aim 3, to crystallographically determine the sites and ligands involved in binding to the specific metal cations for the serine proteases. Aim 4, to determine the role of the EGF2, EGF1, and Gla domains in the serine proteases, factor IXa, factor Xa, and factor VIIa in their activation and inhibition.

Qualifications: Prior research experience is desirable but not essential. Premed and students wishing to attend graduate school for a PhD desired.

Responsibilities: -assist in the following tasks: 1, purifying proteins; 2, cloning and expressing proteins using prokaryotic and eukaryotic expression systems; 3, analyze proteins and DNA fragments by SDS-PAGE and agarose gel electrophoresis; 4, set up crystallization trays; 5, perform kinetic experiments to characterize the effect of mutations

Hours per week: 6 hours per week

Quarters recruiting: Spring 2005

Contact info:

PI	S. Paul Bajaj
Dept	Orthopaedic Surgery/MBI
Address	Box 951795, A3-21 Rehab Bldg
Email	<a href="mailto:pbajaj@mednet.ucla.edu">pbajaj@mednet.ucla.edu</a>

If interested please contact:

	Amy schmidt
	310.825.7603
	<a href="mailto:schmidta@chem.ucla.edu">schmidta@chem.ucla.edu</a>

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