Proteomics and Degradomics in VLU

Joseph D. Raffetto MD
VA Boston HCS, West Roxbury, MA, Harvard Medical School, Boston, MA; Brigham and Women's Hospital
Veith Symposium
November, 2016 New York, NY

Disclosures
Nothing to Disclose No Conflicts of Interest

Proteomics

- Large scale study of proteins particularly their structure and function
- The proteome is the entire set of proteins produced or modified by an organism

Degradomics

- Degradomics aims to identify the protease and protease substrate repertoires (degradomes), of an organism-wide scale, identifying new roles for proteases in vivo
- The study of degradome is directly related to measurements of enzymatic activities and will facilitate the identification of new pharmaceutical targets to treat disease

Differential Proteomic Analysis Distinguishes Tissue Repair Biomarker Signatures in Wound Exudates Obtained from Normal Healing and Chronic Wounds
Sabine A. Eming,a,1 Manuela Koch,a,1 Andreas Krieger,a Ben Brachkopfa,b Sandra Kräft,a Leena Brücker-Tuderman,c,d Thomas Krieg,a,1 John D. Shannon,a and Joy W. Fedea,b

• VLU patients H n=9 NH n=19,
• CVUWF collected, 13,000 xg, supernatant, -80°C
• Proteins separated SDS-PAGE
• Analyzed by LC/MS, significant values 2X
• Identified 149 proteins (differential detection)
  -H 23 proteins
  -NH 26 proteins
• 3 proteins analyzed for proof of concept


Significance
• Lactotransferrin- antimicrobial activity, iron scavenging property, proteolytic activity, inhibition of bacterial biofilm formation, regulate cellular signaling pathways (inflammation, cytokine expression, and cell cycle arrest)
• ANXA1 (annexins)- affect many pathways of the inflammatory response, e.g., leukocytes extravasation and inflammatory cytokine secretion, reduces inflammation (PLA2, COX)
• S100A9- Calcium binding and modulating protein cell growth and differentiation, wound healing

Conclusions
• Proteomics and degradomics provides the opportunity to study novel proteins, function, and activity in VLU
• Provide proof of concept and possible mechanisms in VLU pathology
• Identify biomarkers for treatment, prognosis, and predict healing
• Possible targets for therapy