On the Role of Inflammation in the Aging Process

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“Aging seems to be the only available way to live a long life.”

Daniel Francois Esprit Auber

Via Troen, Mt Sinai J Med 70:3-22
Introduction

• **Holy grail**: What causes adverse aging?
  – Experimental data on humans: hard to come by
  – Observational, longitudinal data: central

• Cohort studies on aging abound
  – EPESE; CHS; HRS/ALIVE
  – Women’s Health and Aging Study (WHAS)
  – InCHIANTI
Introduction

• Inflammation & Accelerated Aging
  – Cellular repair
  – Muscle wasting (Ferrucci et al., JAGS 50:1947-54; Cappola et al, J Clin Endocrinol Metab 88:2019-25)
  – Receptor inhibition: erythropoietin production / anemia (Ershler, JAGS 51:S18-21)

• Two themes
  – *Homeostasis/balance*: cytokines, hormones, nutrition, immune response
  – “Causal pathways”
A Challenge: Determining Roles Amid Complex Measurement

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Challenge #1: Complex Measurement

IL-18

IL-1RA

IL-6

CRP

TNF-α

Inflammation 1

Inflammation 2
Challenge #2: Determining Roles

- Inflammation
- Mobility
- Age, Gender, Smoking
- Hx: CVD, Cancer, Diabetes

- Propensity scoring (Rosenbaum & Rubin, 1983)
- My work: Implementation amid latent variables
Inflammation Effects (Summary 2)
Translation and Training

Publications
- Bandeen-Roche et al., *JASA*, 1997
- Bandeen-Roche et al., *AJE*, 1999
- Huang & Bandeen-Roche, *Psychometrika*, in press
- Cappola et al., *J Clin Endocrinol Metab*, 2001
- Ferrucci et al., *JAGS*, 2002
- Leng et al., *J Gerontol Med Sci*, in press

Research funding
- Women’s Health and Aging Study III – Merit Award
- Johns Hopkins Older Americans Independence Center

Education
- Training Program in the Epidemiology & Biostatistics of Aging
Future Goals

• Grounding of statistics in science

• Assessment of extent to which causal mechanisms can be delineated with observational data