

The kit that fits: Comparing EIA-based testosterone measurement to tandem mass spectrometry

Keith M. Welker, PhD
University of Massachusetts Boston

Bethany Lassetter
University of Iowa



Cassandra Brandes, Smrithi Prasad,
University of Oregon

Dennis R. Koop,
Oregon Health and Sciences University

and
Pranjal H. Mehta, PhD
University of Oregon



Thanks to: Jenny Luo, Oregon Health and Sciences University



The kit that fits:

Comparing EIA-based testosterone measurement to tandem mass spectrometry

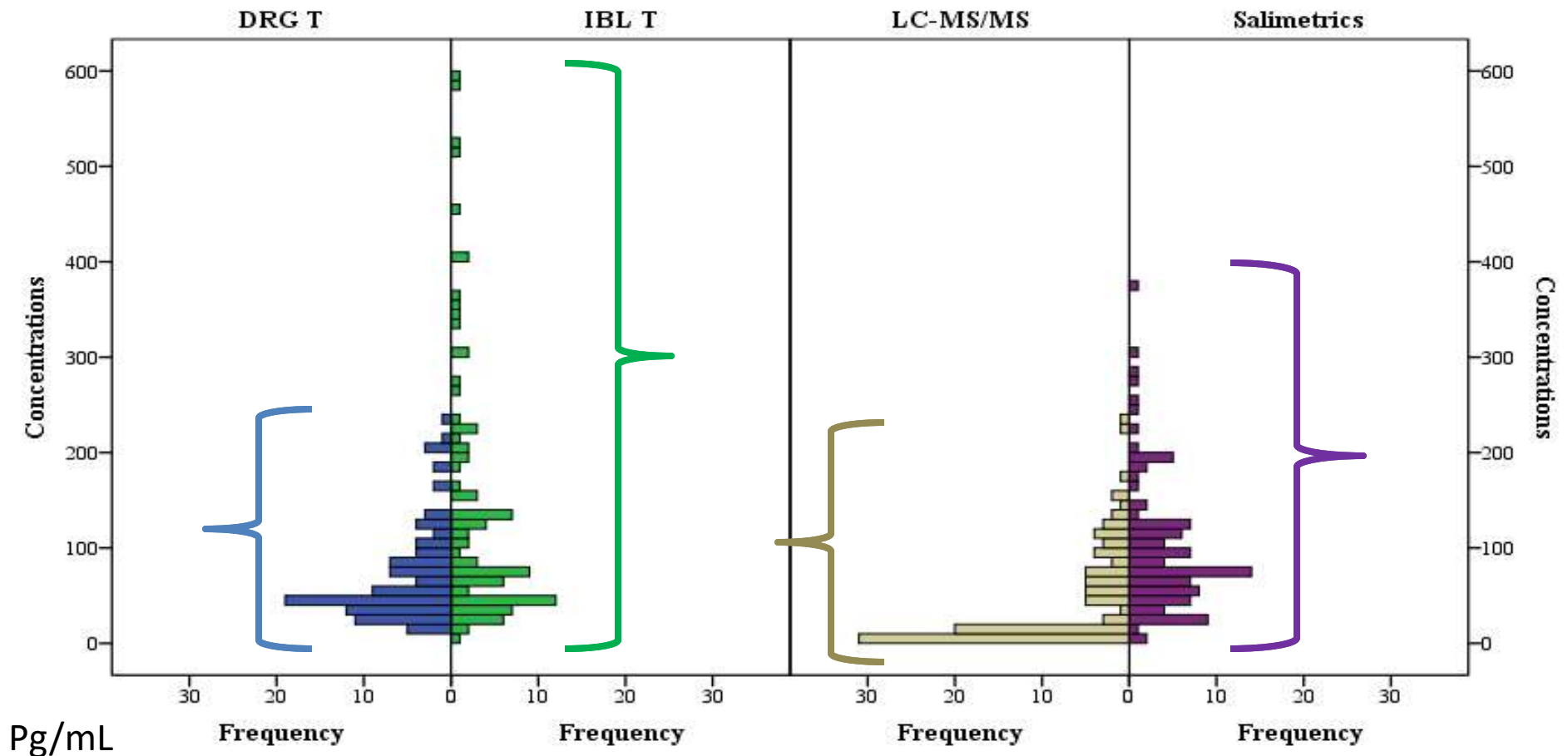
- Using EIAs to assess salivary testosterone
- Pros: affordable, easy, and noninvasive
- Cons:
 - differences in specificity
 - quantification errors
 - ill-suited for populations with very high/low concentrations
- Current research: Compare three popular commercial EIAs to liquid chromatography tandem mass spectrometry (LC-MS/MS)
 - Highly accurate, sensitive reference method for assessing hormones
 - Previously been used to compare multiple cortisol EIAs (Miller et al., 2013)



The kit that fits:

Comparing EIA-based testosterone measurement to tandem mass spectrometry

- 100 samples obtained via passive drool
- Used three ELISAs (DRG, IBL, and Salimetrics) and LC-MS/MS to measure T



The kit that fits:

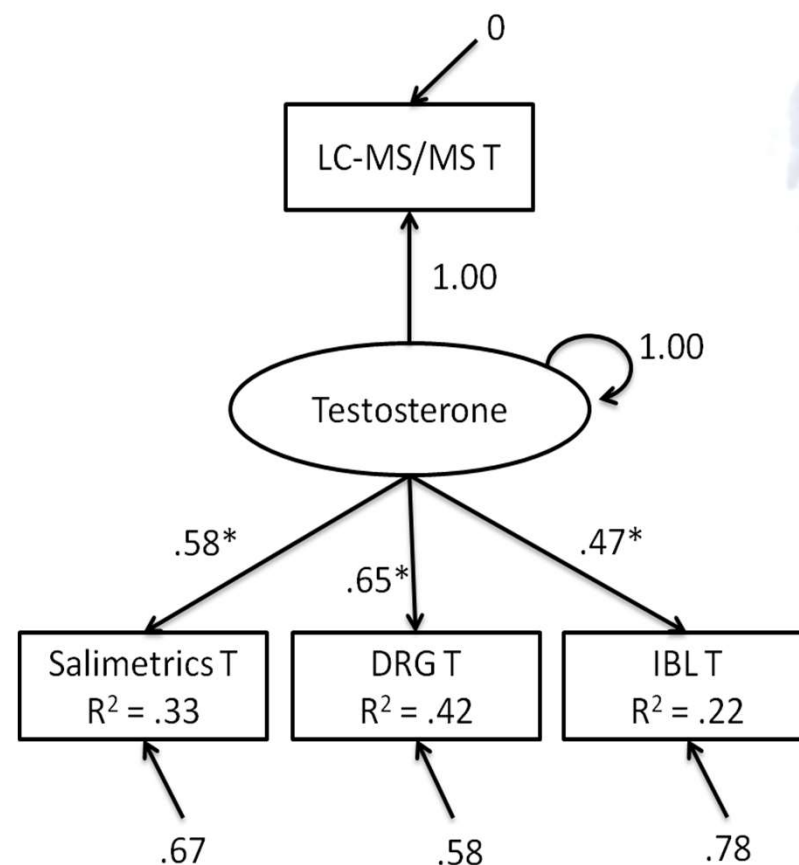
Comparing EIA-based testosterone measurement to tandem mass spectrometry

Correlations between methods

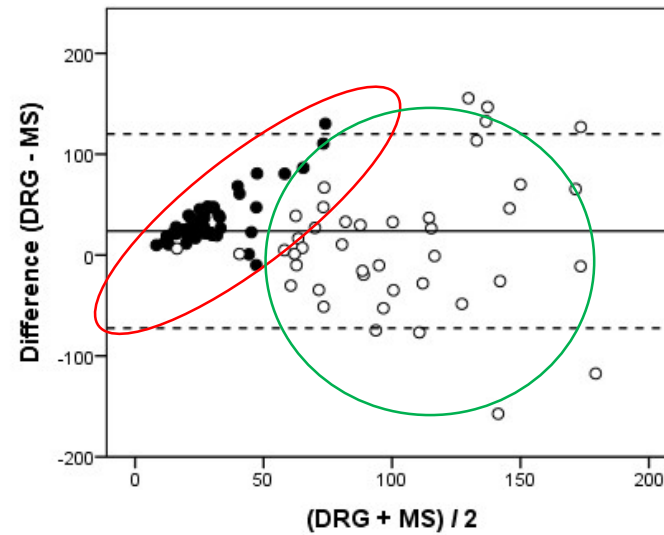
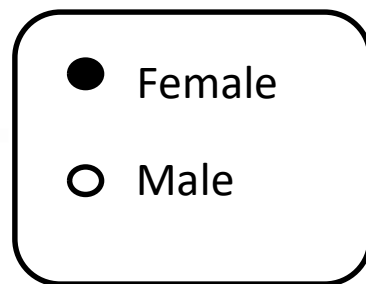
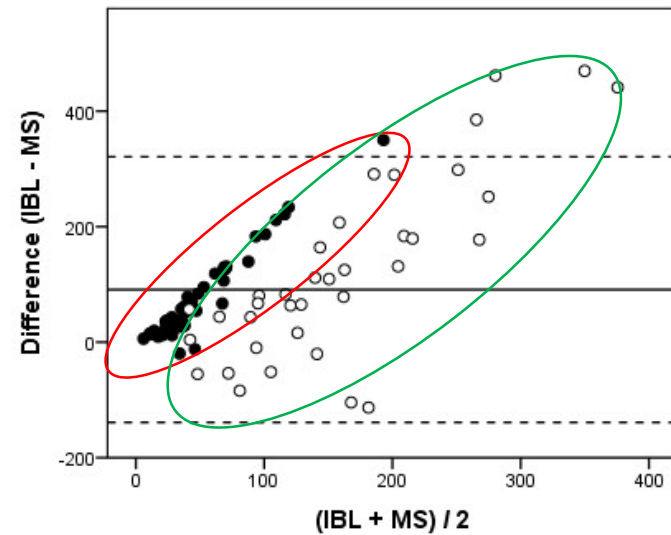
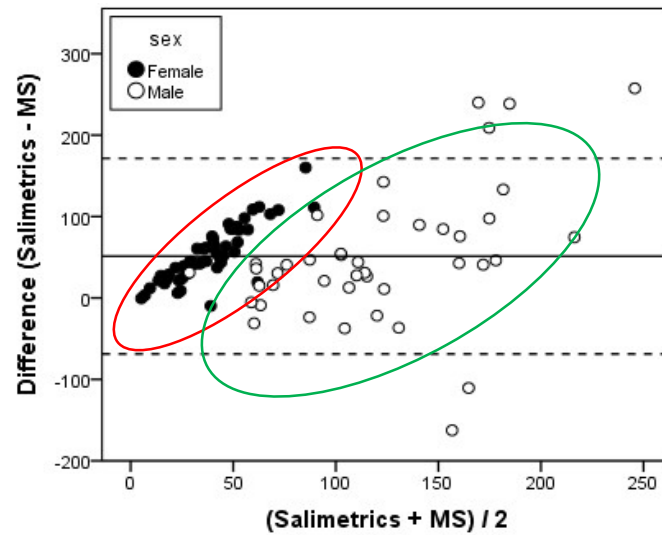
	MS	SalIM	DRG	IBL
MS	—			
SalIM	.55***	—		
DRG	.57***	.67***	—	
IBL	.47***	.71***	.67***	—

Compare to Miller et al (2013) for cortisol – mean r with LC-MS/MS was .94

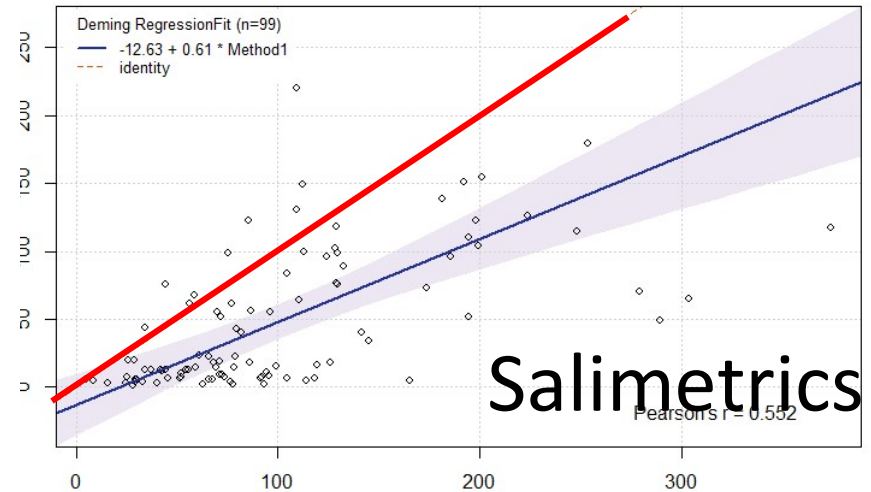
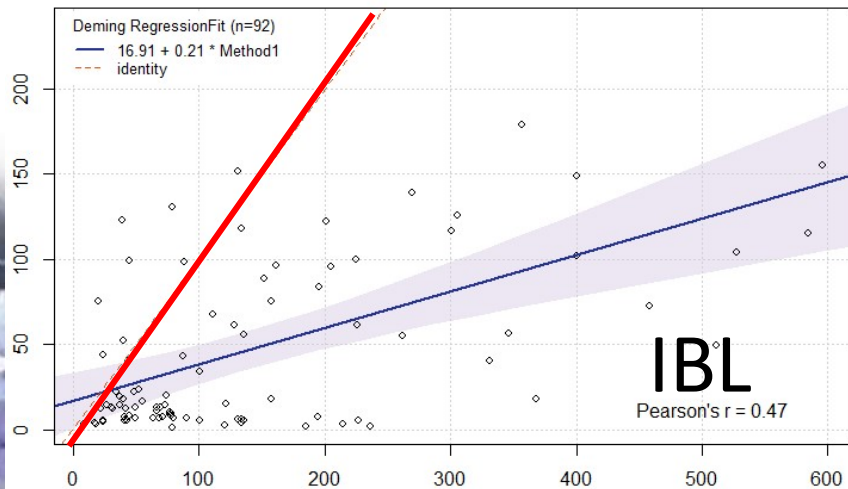
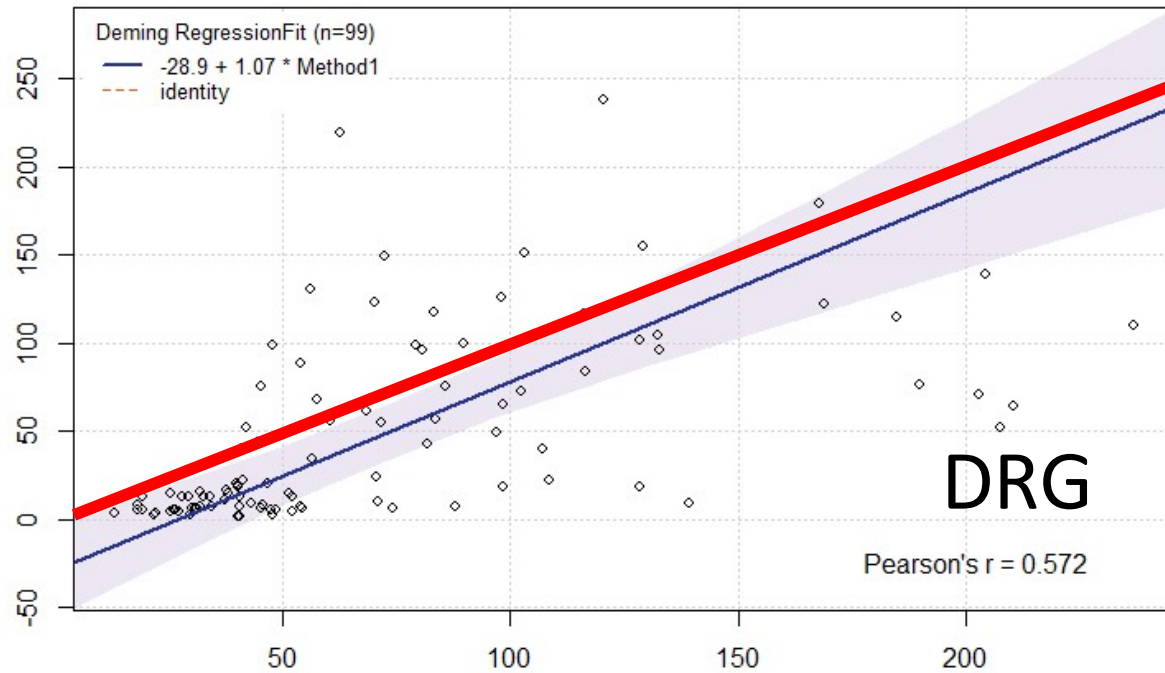
Confirmatory Factor Analysis



Bland-Altman Plots



Deming Regressions



The kit that fits?

- DRG most closely approximated LC-MS/MS T, had least measurement error
- Followed by Salimetrics, then IBL
- Several limitations noted of T EIAs:
 - Differential assessment of T in men vs. women
 - Lower associations between EIAs and LC-MS/MS compared to cortisol ($r \sim .53$ vs. $.94$)
- Future Directions: Alternatives to EIAs, LC-MS/MS, Pharmacological Administration

