I180803DISB

PromarkerD ELISA vs MS analysis of IGFBP3 concentrations

Scott Bringans, Kirsten Peters

Aim:
Compare IGFBP3 concentrations from ELISA (using new antibodies) and mass spec testing of the same plasma samples using Bland Altman plot analysis. Can the ELISA biomarker concentrations be adjusted to be in agreement with the MS values.

Data:
This analysis was performed on the ELISA plasma data from 2nd August 2018 and the original MS plasma data.

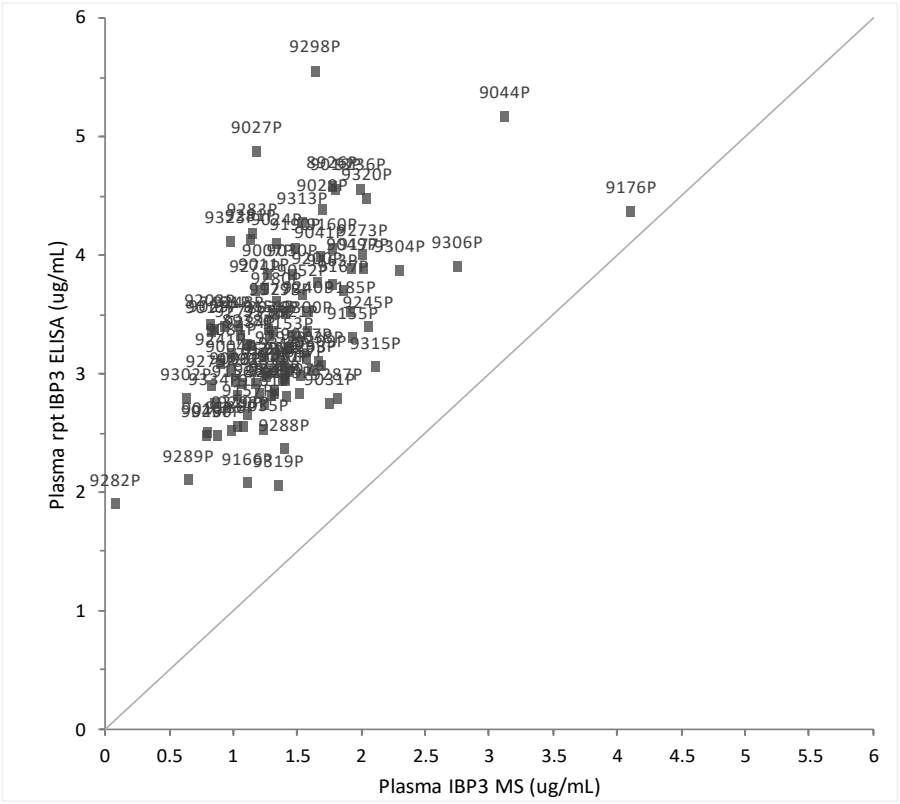
Summary:

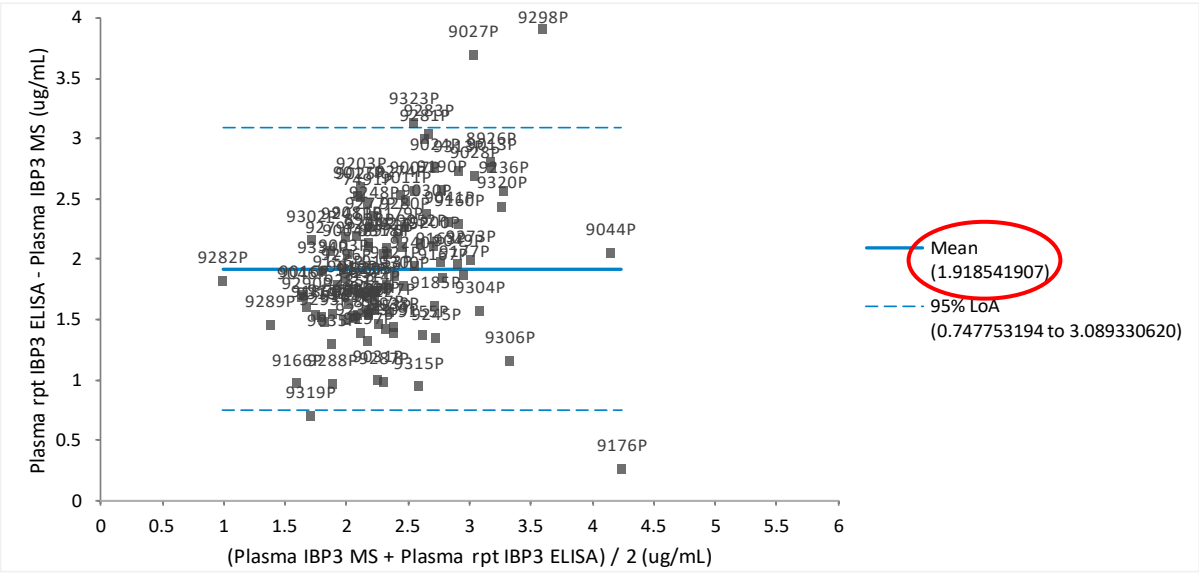
- For IGFBP3 there has been a significant improvement in the dynamic range of the ELISA plasma readings with the use of the new antibodies.
- The mean difference between the two tests is 1.92 ug/mL. The ELISA values are higher than the MS values.
- When all ELISA values are decreased by 1.92 ug/mL there is no significant difference between the two methods.

Comparison of PromarkerD concentrations measured by MS and ELISA (using new antibodies)

IGFBP3

- The first scatter plot of ELISA versus MS showed a few outliers which were initially included in the Bland Altman plot.
- The first Bland Altman plot showed a mean bias of 1.92, meaning ELISA concentrations were on average 1.92 ug/mL higher than MS. No outliers removed.





N	98

	Minimum	Maximum
Plasma IBP3 MS	0.080841619	4.106694445
Plasma rpt IBP3 ELISA	1.896030715	5.546472393
(Plasma IBP3 MS + Plasma rpt IBP3 ELISA) / 2	0.988436167	4.235147985

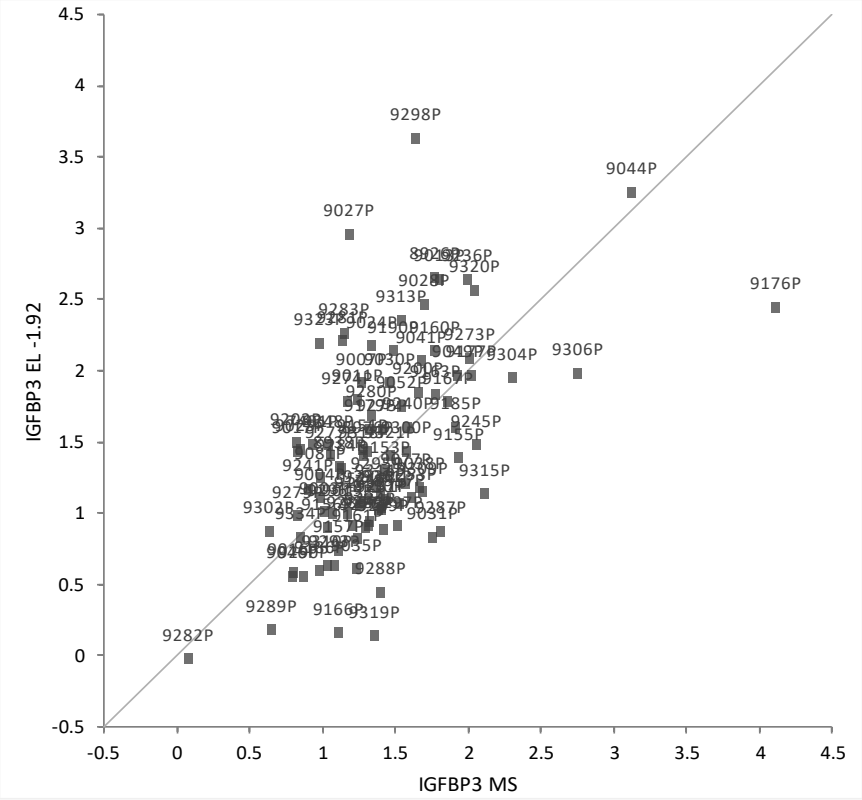
Correlation - r	0.538

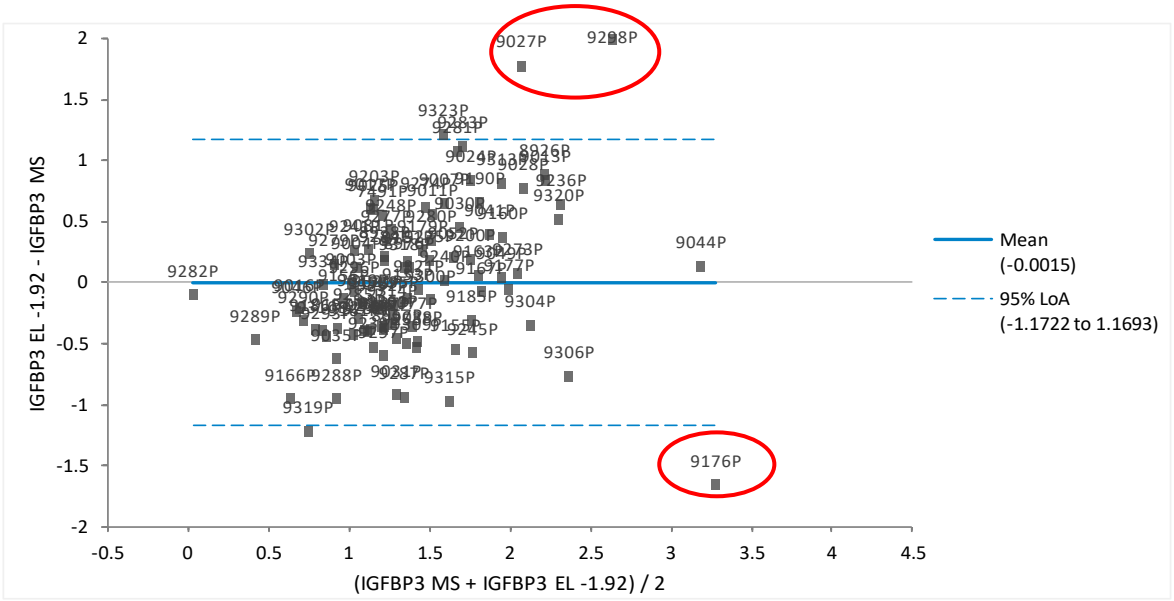
Fit Differences

Parameter	Estimate	95% CI	SE
Mean difference	1.918541907	1.798780376 to 2.038303439	0.060341680
95% Lower LoA	0.747753194	0.542386409 to 0.953119979	0.103473767
95% Upper LoA	3.089330620	2.883963836 to 3.294697405	0.103473767

SD	0.597352157

- After 1.92 ug/mL was subtracted from all ELISA concentrations, the Bland Altman plot analysis was repeated:





N	98

	Minimum	Maximum
IGFBP3 MS	0.0808	4.1067
IGFBP3 EL -1.92	-0.0240	3.6265
(IGFBP3 MS + IGFBP3 EL -1.92) / 2	0.0284	3.2751

Correlation - r	0.538

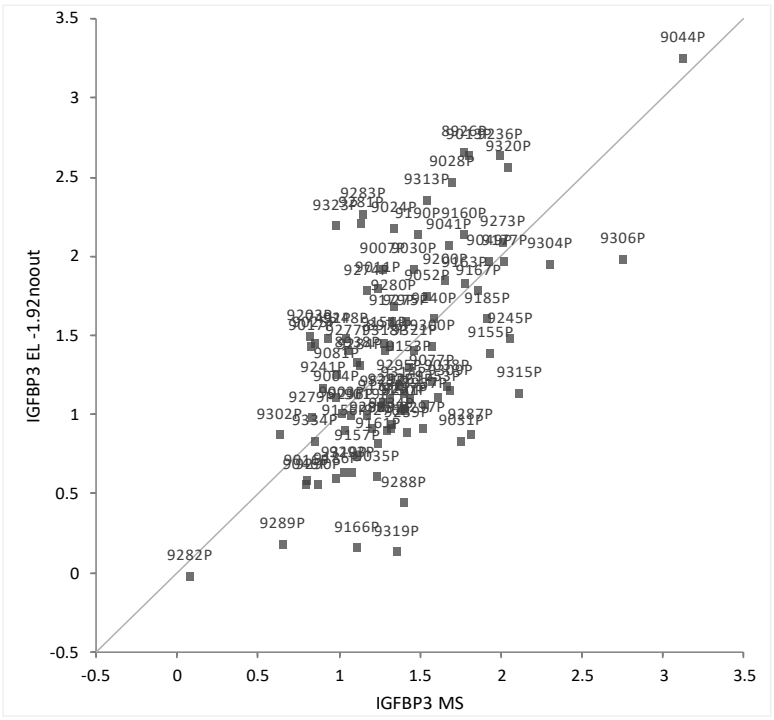
Fit Differences

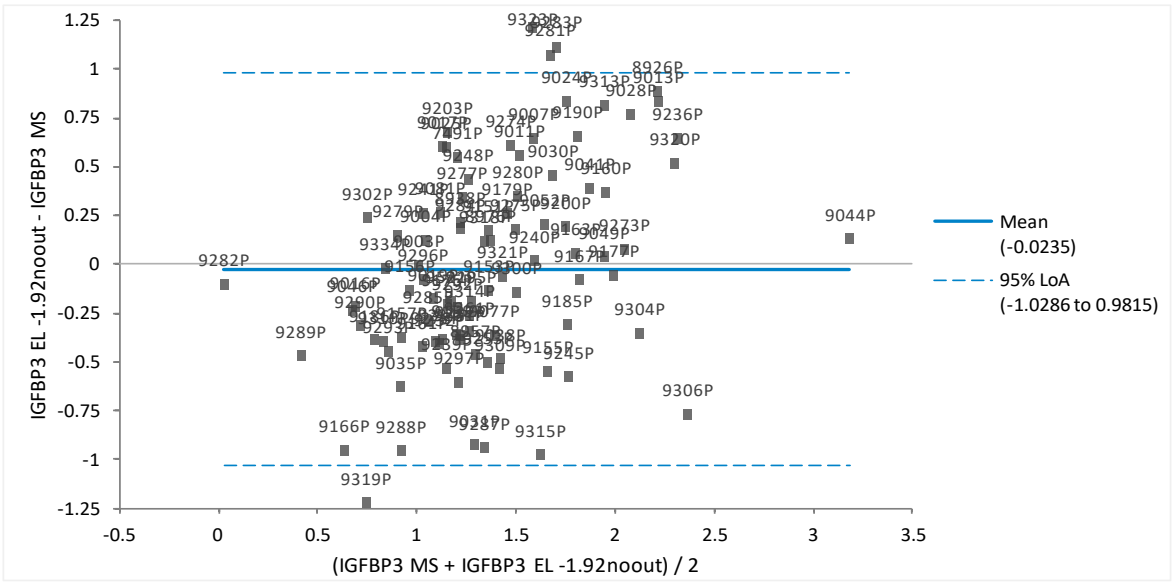
Parameter	Estimate	95% CI	SE
Mean difference	-0.0015	-0.12122 to 0.11830	0.06034
95% Lower LoA	-1.1722	-1.37761 to -0.96688	0.10347
95% Upper LoA	1.1693	0.96396 to 1.37470	0.10347

SD	0.5974

P=0.98 (Methods are not significantly different)

- There were three patients outside the 95% limits of agreement (9027, 9298, and 9176). The following plots remove those three patients.

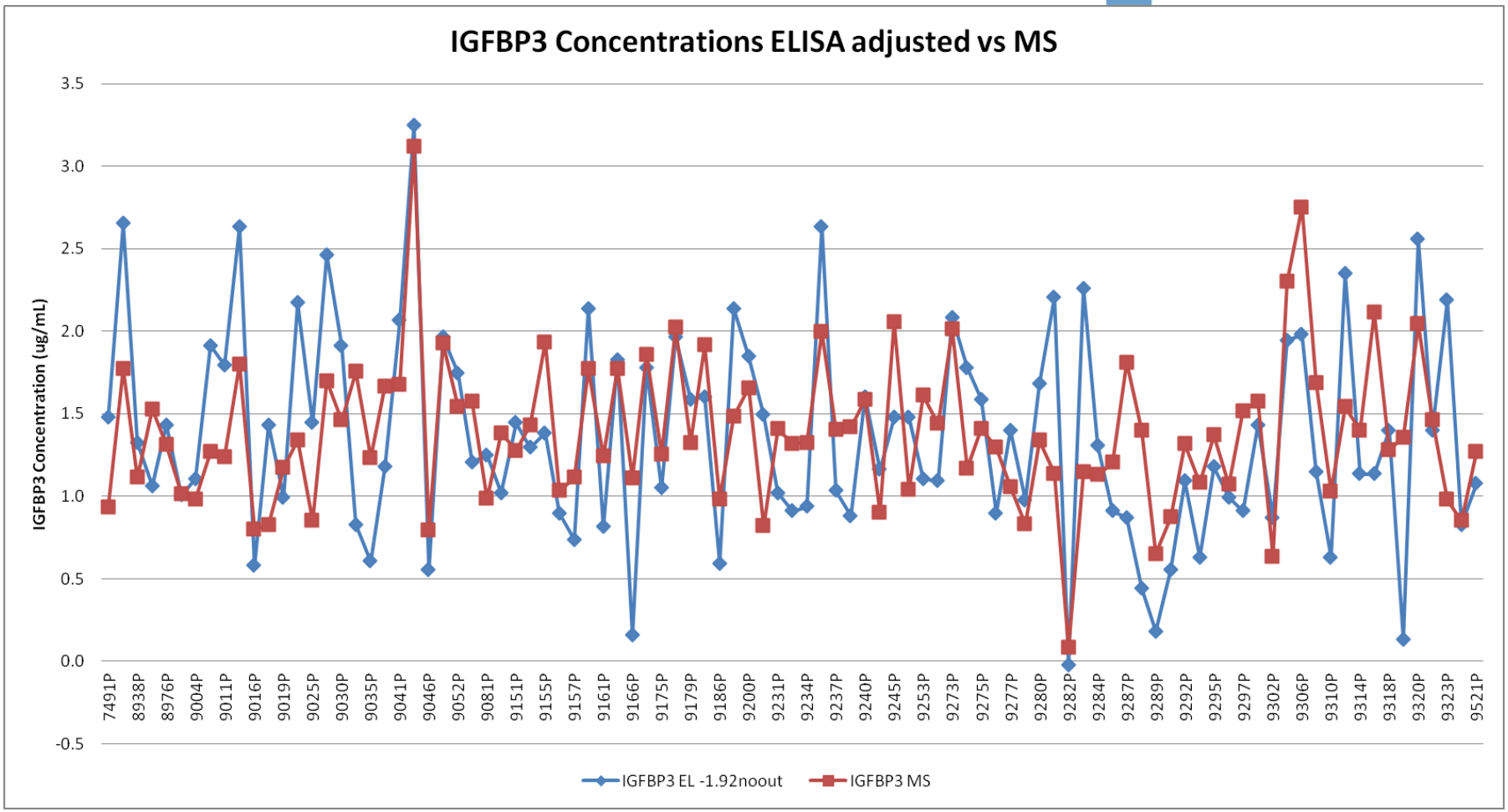




P=0.66 (Methods are not significantly different)

- ELISA is on average 0.02 ug/mL lower than MS after the previous adjustment of -1.92, but the two methods are not significantly different so no further adjustment is required.

Conclusion for IGFBP3: Subtract 1.92ug/mL from all ELISA concentrations to adjust the ELISA values to those of the MS.


IGFBP3 Concentrations ELISA adjusted vs MS
IGFBP3 Concentration (ug/mL)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
7491P
8938P
8976P
9004P
9011P
9016P
9019P
9025P
9030P
9035P
9041P
9046P
9052P
9081P
9151P
9155P
9157P
9161P
9166P
9175P
9179P
9186P
9200P
9231P
9234P
9237P
9240P
9245P
9253P
9273P
9275P
9277P
9280P
9282P
9284P
9287P
9289P
9292P
9295P
9297P
9302P
9306P
9310P
9314P
9318P
9320P
9323P
9521P
IGFBP3 EL -1.92noout
IGFBP3 MS