

Topic: EURIA Gastrin, MD302

Gastrin is released into the circulation in several forms: Gastrin-71,-52, -34, -17, and -14. They are all present both as sulphated and non-sulphated forms. As the primary structure of gastrin is very well preserved among mammals, the EURIA Gastrin assay can theoretically be used on samples from mammals in general. The major forms in human plasma are gastrin-34 and gastrin-17. They are equal in bioactivity but differ in half-life where gastrin-34 is ten times longer in the circulation than gastrin-17. In hypergastrinemic conditions the relative fraction of larger forms of gastrin increases as a result of incomplete intravesicular processing.

Gastrin is often used to diagnose Zollinger-Ellison Syndrome (ZES) which is basically caused by a gastrin producing tumour. Since there are several forms of gastrin the general characteristics of the antiserum is crucial for its clinical use. The antiserum in the EURIA Gastrin kit is raised against Gastrin-17 and is quite unique regarding its spectrum of specificity, it is clinically superior as a tool for diagnosing the Zollinger-Ellison syndrome and recommended in publications by Prof J Rehfeld*.

Table 1. Deming Regression Analysis comparing the results of the Reference gastrin assay with those of commercial gastrin immunoassays from diagnostic companies, adapted from *Rehfeld J et al: Gastroenterology 140:1444-53 (2011).

| Manufacturer | Slope | 95% confidence interval | Y-intercept when X=0 | 95% confidence interval | P value | r (Pearson) |
|------------------|-------|-------------------------|----------------------|-------------------------|---------|-------------|
| Euro Diagnostica | 1.17 | 1.03-1.31 | -4 | -38 to 29 | <.0001 | 0.96 |
| Biohit | 1.16 | 0.59-1.72 | -86 | -221 to 49 | <.0001 | 0.62 |
| Correlate | 3.61 | 2.23-5.00 | -292 | 622 to 38 | <.0001 | 0.71 |
| DiaSorin | 0.66 | 0.50-0.82 | -2 | -40 to 37 | <.0001 | 0.85 |
| DRG Diagnostics | 0.82 | 0.61-1.04 | 2 | -50 to 54 | <.0001 | 0.83 |
| MP Biomed | 1.35 | 1.05-1.64 | -32 | -103 to 38 | <.0001 | 0.87 |
| Peninsula | 1.04 | 0.75-1.32 | -29 | -97 to 40 | <.0001 | 0.81 |
| Phoenix EIA | 2.67 | 1.35-4.00 | -284 | -597 to 29 | <.0001 | 0.62 |
| Phoenix RIA | 0.73 | 0.00-1.50 | -31 | -231 to 151 | <.0001 | 0.34 |
| Siemens Immulite | 2.34 | 1.59-3.09 | -157 | -342 to 28 | <.0001 | 0.78 |
| Siemens RIA | 0.86 | 0.61-1.10 | -6 | -66 to 54 | <.0001 | 0.80 |
| US Biological | 2.75 | 0.75-4.76 | -364 | -842 to 114 | <.0001 | 0.47 |

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Doc: No: E-126-GB00, February 2015

Table 2. Probability of valid diagnostic measurement of gastrin concentrations in plasma from patients with both ZES symptoms and plasma concentrations <1247 pg/mL (<600 pmol/L) with the indicated commercial gastrin immunoassay kits, as compared with measurements made with a validated reference RIA, adapted from Rehfeld J et al: Clin Chem 58: 831-36 (2012).

| Gastrin kit | Probability % |
|-------------------------------|---------------|
| Euro Diagnostica | 100 |
| Assay Designs (Correlate EIA) | 77 |
| Biohit | 68 |
| DiaSorin | 77 |
| DRG Diagnostics | 94 |
| MP Biomedicals | 87 |
| Peninsula Laboratories | 81 |
| Phoenix Pharmaceuticals ELISA | 84 |
| Phoenix Pharmaceuticals RIA | 45 |
| Siemens | 90 |
| Siemens RIA | 97 |
| US Biological | 68 |

Specificity data

Normal level of gastrin in human serum: ≤ 60 pmol/L (fasting level).

Structure:

Pyr-Gly-Pro-Trp-Leu-Glu-Glu-Glu-Glu-Glu-Ala-Tyr-Gly-Trp-Met-Asp-Phe-NH₂

Cross reactions:

| Compound | Cross reactivity |
|---------------------------|------------------|
| Gastrin-17 | 100.0% |
| Gastrin-17, sulphated | 83% |
| Gastrin-34 | 61% |
| CCK-8* | 36% |
| Gastrin 1-14 | <0.1% |
| Gastrin releasing peptide | <0.01% |

* The cross-reactivity with CCK-8 is moderate and of less relevance as a normal level of CCK is 1.12 pmol/L (determined by Euro Diagnostica EURIA CCK).

References

Rehfeld J et al: Gastroenterology 140: 1444-53 (2011)
 Rehfeld J et al: Clin Chem 58: 831-36 (2012)

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