

Abstract Submitted  
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**Biochemical response and the effects of bariatric surgeries on type 2 diabetes**<sup>1</sup> ROLAND ALLEN, TYLER HUGHES, JIA LERD NG, ROBERTO ORTIZ, Texas A&M University, MICHEL ABOU GHANTOUS, OTHMANE BOUHALI, Texas A&M University at Qatar, ABDELILAH ARREDOUANI, Qatar Biomedical Research Institute — A general method is introduced for calculating the biochemical response to pharmaceuticals, surgeries, or other medical interventions. This method is then applied in a simple model of the response to Roux-en-Y gastric bypass (RYGB) surgery in obese diabetic patients. We specifically address the amazing fact that glycemia correction is usually achieved immediately after RYGB surgery, long before there is any appreciable weight loss. Many studies indicate that this result is not due merely to caloric restriction, and it is usually attributed to an increase in glucagon-like peptide 1 (GLP-1) levels observed after the surgery. However, our model indicates that this mechanism alone is not sufficient to explain either the largest declines in glucose levels or the measured declines in the homeostatic model assessment insulin resistance (HOMA-IR). The most robust additional mechanism would be production of a factor which opens an insulin-independent pathway for glucose transport into cells, perhaps related to the well-established insulin-independent pathway associated with exercise. Potential candidates include bradykinin, a 9 amino acid peptide. If such a substance were found to exist, it would offer hope for medications which mimic the immediate beneficial effect of RYGB surgery.

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