



Applications of the Anaerobic Digestion Process

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Introduction

At the start of the new millennium waste management has become a political priority in many countries. One of the main problems today is to cope with an increasing amount of primary waste in an environmentally acceptable way. Bio-wastes, i.e., municipal, agricultural or industrial organic waste, as well as contaminated soils etc., have traditionally been deposited in landfills or even dumped into the sea or lakes without much environmental concern. In recent times, environmental standards of waste incineration and controlled land filling have gradually improved, and new methods of waste sorting and resource/energy recovery have been developed. Treatment of bio-wastes by anaerobic digestion processes is in many cases the optimal way to convert organic waste into useful products such as energy (in the form of biogas) and a fertilizer product.

Other waste management options, such as land filling and incineration of organic waste has become less desirable, and legislation, both in Europe and elsewhere, tends to favor biological treatment as a way of recycling minerals and nutrients of organic wastes from society back to the food production and supply chain. Removing the relatively wet organic waste from the general waste streams also results in a better calorific value of the remainder for incineration, and a more stable fraction for land filling. GERD has a significant socioeconomic burden due to its chronic nature and high prevalence, with approximately 20% of the population affected in western countries. Expenditure on GERD is enormous (\$15–20 billion in the US alone in 2006), with spending chiefly on medications. Medications that aim to alleviate or reduce stomach acid secretion include antacids, histamine–receptor antagonists, and proton–pump inhibitors. However, the efficacy of these medications varies considerably, and most people need prolonged or lifelong use. Furthermore, some have resistance to these medications and, in some cases, medication is insufficient and surgical interventions are required. Developing a better understanding of the etiology of GERD may lead to improved management strategies, such as development of novel or repurposed treatments, ultimately reducing the incidence of BE and EA.

Previous twin studies have shown a significant genetic contribution to the etiology of GERD, with an estimated heritability of 30%–40%. We recently showed that GERD has a polygenic basis, and estimated a high genetic correlation between GERD and BE ($R_G=0.77$, $SE=0.24$), and between GERD and EA ($R_G=0.88$, $SE=0.25$). Thus in addition to improving our understanding of GERD, identifying genetic variants for GERD will likely inform our understanding of the genetics of BE/EA. However, previous work has not identified any genome-wide significant ($P<5 \times 10^{-8}$) risk loci for GERD.

In this study, we perform a large Genome-Wide Association Study (GWAS) meta-analysis of GERD, using population-based studies from the UK, USA, and Australia. We aim to: (1) Validate the use of self-reported reflux medication as a proxy for GERD in GWAS studies in order to increase statistical power; (2) Identify risk loci for GERD; (3) Investigate the effect of GERD risk loci on BE and EA; (4) Identify the extent of genetic overlap between GERD and its known risk factors (e.g., Body Mass Index (BMI)) as well as other complex traits; and (5) Find candidate drugs that target significant genes. Authors performed pathway-based enrichment analyses using the GERD meta-analysis results in DEPICT. The undesired impact of these conditions is a diminished capacity or complete inability to effectively drive intestinal substance down the stomach related parcel. On the off chance that this condition isn't adjusted, ailing health or even starvation may happen. In addition sickness or heaving or both may likewise happen. Though a portion of these illness states can be remedied by prescription or by basic medical procedure, as a rule therapy with drugs isn't enough successful and medical procedure frequently has unbearable physiologic consequences for the body. By and by, notwithstanding, there is no basically successful gadget or framework to trigger keenly modifies the solid withdrawals of smooth muscle and the gastrointestinal lot specifically. Consequently, there is a need in the workmanship for a framework and technique to appropriately invigorate the gastrointestinal lot to in this way treat insufficient or missing electrical solid action of the gastrointestinal lot. This and different items are given by at least one of the exemplifications depicted beneath. The current innovation is a strategy and device for giving electrical incitement of the gastrointestinal plot. The mechanical assembly includes an implantable heartbeat generator which might be coupled to the gastric framework through at least one clinical electrical leads. In the favored encapsulation the leads couple to the roundabout layer of the stomach. The beat generator ideally includes sensors for detecting gastric electrical action, and specifically, regardless of whether peristaltic constrictions as happening. Specifically two sensors are highlighted.