

polymorphisms in GPCRs influence drug efficacy and side effects. Mutations in the β -adrenergic receptor modulate the effects of the high blood pressure and heart attack prevention drug propranolol—the first drug to target a GPCR. Changes to dopamine receptors affect drugs that treat schizophrenia and Parkinson’s disease. Serotonin receptor mutations affect responses to anti-depression and anxiety drugs—including Prozac® and Paxil®—and can increase the risk of side effects, such as weight gain or involuntary movements. Bitter taste is a common side effect of many drugs and is a major reason why patients fail to take some medicines. This is probably due to off-target effects, when drug molecules bind to taste receptors as well as the intended target. Research on taste receptors offers a potential solution to this problem: blocking the sensation of bitterness or “tuning” a drug to individual variations in taste.

The recent discovery that taste receptors are expressed widely and have “extrasensory” functions makes the receptors further candidates for drug development. Some bitter taste receptors are expressed in the lungs, where they open airways following inhalation of bitter compounds, suggesting new drugs for asthma and other lung diseases. Taste receptors are also expressed in the upper airway, where they help detect compounds produced during bacterial infection. Mutations in TAS2R38 are associated with increased risk of chronic sinusitis, which is probably due to defects in sensing Gram-negative bacteria. Other taste receptors recognize different bacteria. In each case, receptor binding to bacterial compounds leads to the production of antibacterial compounds called beta-defensins. Thus, patients with sinusitis may benefit from inhaling bitter substances.

As mentioned in the previous *Carolina Tips*® article, students can use the Carolina kit [Using a Single Nucleotide Polymorphism \(SNP\) to Predict Bitter Tasting Ability \(items #211376 through 211381\)](#) to examine a mutation in the TAS2R38 gene that predicts PTC tasting ability. Students may then contemplate the implications of genetic variation in personal taste, human evolution, and health the next time they enjoy broccoli or bignay berry pie.

 <p>PTC Extraction, Amplification, and Electrophoresis Kit with Ethidium Bromide and 0.2-mL Tubes (with Item #211379)</p> <p>\$235.00</p> <p>Qty <input type="text" value="1"/> <input type="button" value="Add to Cart"/></p>	 <p>PTC Extraction, Amplification, and Electrophoresis Kit with Ethidium Bromide and 0.5-mL Tubes (with Item #211378)</p> <p>\$255.00</p> <p>Qty <input type="text" value="1"/> <input type="button" value="Add to Cart"/></p>	 <p>PTC Extraction, Amplification, and Electrophoresis Kit with CarolinaBLU™ and 0.5-mL Tubes (with Prepaid Item #211380)</p> <p>\$245.00</p> <p>Qty <input type="text" value="1"/> <input type="button" value="Add to Cart"/></p>	 <p>PTC Extraction, Amplification, and Electrophoresis Kit with CarolinaBLU™ and 0.2-mL Tubes (with Prepaid Item #211381)</p> <p>\$225.00</p> <p>Qty <input type="text" value="1"/> <input type="button" value="Add to Cart"/></p>	 <p>PTC Extraction and Amplification Kit with 0.2-mL Tubes (with Prepaid Coupon)</p> <p>Item #211377</p> <p>\$215.00</p> <p>Qty <input type="text" value="1"/> <input type="button" value="Add to Cart"/></p>
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