Genetic Selection System for microRNA Target Genes

miRNA target determination largely relies on computer-aided algorithms based on the nucleotide base pairing of a miRNA sequence and the 3’-untranslated regions of a potential target gene. However, predicted targets vary from one program to another. Recent evidence also indicates that even perfect base pairing may not predict miRNA-target interactions.

Invention
This novel system utilizes a specially constructed plasmid that contains a puromycin resistance gene, a resistance gene blocker, and cDNA for a gene of interest. The plasmid is transfected into host cells along with a vector expressing a miRNA. If the cDNA contains a miRNA target, the cells will live in the presence of puromycin. If the cDNA does not contain a miRNA target, the cells will die in the presence of puromycin. This method can be used with cDNAs and miRNAs of interest as a rapid screening tool that provides clear and measurable results. This invention could be sold either as individual plasmids or a kit and would save researchers weeks to months performing individual target validation tests.

Key Advantages
• Research tool
• RNA/DNA research
• microRNA screening/target validation
• High throughput
• Ease of use
• Measurable results
• No reliance on variable computer-based software for target prediction

Status
• U.S. Patent # 8,852,926 issued October 7, 2014
• This technology incorporates proprietary materials controlled by Tet Systems GmbH & Co. KG. Additional permissions and commercialization rights from Tet Systems may be required to market this technology.
• Current work is focused on optimizing the experimental system to create greater reliability and reduce the number of false positives.
• The technology is available for license.