

Evaluation and Licensing Opportunities

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Patent Literature

US Patent No. 6,753,139
US Patent No. 7,704,688
US Patent No. 8,097,710
US Patent No. 8,258,285
US Patent No. 8,263,569
US Patent No. 8,299,235
US Patent No. 8,349,607

Additional applications pending.
Further details available on request.

Gene Silencing: siRNA technology for Plants and other Organisms

1) Detecting the presence of gene silencing

2) Inducing gene silencing

Posttranscriptional gene silencing (PTGS) is an invaluable tool for investigating and controlling gene function in plants, mammalian cells and other organisms. RNA interference (RNAi) is rapidly becoming of great importance to mammalian cell research and drug development in humans. Using short interfering RNAs (siRNA) is a preferred method both for the detection and the induction of gene silencing via this pathway and is now recognised by the pharmaceutical industry as an efficient method in the development of novel gene therapy drugs. In addition siRNAs are also gaining importance in the AgBiotech field.

Professor David Baulcombe and colleagues at the Sainsbury Laboratory were the first to identify and recognise the importance and critical role of short RNAs of between 21 and 25 nucleotides in PTGS in a range of organisms, including plants. Detection of these short RNAs can be used as a diagnostic tool for correlating the efficiency of silencing of a target gene in any experimental system including the use of RNAi and in cataloguing and profiling miRNA expression patterns. More importantly, siRNAs can also be used in a number of ways to effect gene silencing by introducing siRNAs into organisms to silence specific target genes. This important intellectual property is assigned to PBL from the Sainsbury Laboratory.

As well as its detection / diagnostic applications, PBL's siRNA intellectual property relates broadly to the use of short RNAs in the induction of gene silencing. The specific siRNAs or miRNAs that effect silencing can be introduced into organisms, like plants and mammals by a range of methods, by using a precursor RNA or alternatively to directly introduce the siRNA itself. The siRNA can then be used as a research tool or alternatively in applications requiring the highly targeted and efficient silencing of messages. An increasingly important application of siRNAs is their use in human therapeutics, either in drug development research or directly as a therapeutic agent.

Applications

- Effective gene silencing of specific target genes by siRNAs for use in e.g. human therapeutics
- Using siRNA induced silencing in studies identifying the function of genes
- Rapid and specific diagnostic tool for detecting gene silencing in any organism including via RNAi
- Rapid diagnostic tool for measuring the efficiency of gene silencing in any organism including via RNAi
- Profiling of miRNA expression patterns

References:

AJ Hamilton and DC Baulcombe (1999). A species of small antisense RNA in posttranscriptional gene silencing in plants. *Science* **286**, 950-952.