



PBL AWARDED FURTHER US PATENT ON SHORT RNAi MOLECULES: US 8,299,235

Plant Bioscience Limited (PBL) is pleased to announce that the United States Patent and Trademark Office (USPTO) has issued US Patent No. 8,299,235 with fundamental claims directed to compositions to effect gene silencing.

The new patent, US Patent No. 8,299,235, allows claims to short antisense molecules of 21 to 30 nucleotides in length for silencing gene targets in a wide range of eukaryotes, including mammals, plants and protozoa, as well as targets in pathogens. PBL now holds a portfolio of six issued US patents that cover the methods of using siRNA molecules of 20 to 30 nucleotides to effect gene silencing as well as the siRNA molecules themselves. PBL's patent portfolio in this field of RNA interference (RNAi) covers many current research, development and manufacturing processes used in the pharmaceutical, diagnostic and agricultural biotechnology industries. These patents arise from the seminal research and discoveries of Professor Sir David Baulcombe and Dr Andrew Hamilton in the field of gene silencing.

Silencing is a natural mechanism for down-regulating gene expression that is found in most complex organisms and it is the focus of tremendous activity in the life science industry. It has been widely exploited in research for gene discovery, and for characterisation of gene function. It holds great promise as a therapeutic tool, and currently treatments are being developed for conditions as diverse as cancer, viral diseases and obesity.

PBL non-executive director, Andrew Sandham, comments "We are now seeing the seminal RNAi research of Baulcombe and Hamilton being translated into patient benefits through clinical research in oncology, genetic disorders and other diseases. We are proud to be working with our pharma and biotech company partners that have made this possible and look forward to the availability of licensed RNAi diagnostic tests and therapeutic products over the next several years."

Dr Jan Chojecki, Managing Director of PBL adds "Our strong patent portfolio in RNAi has been endorsed by our partnering strategy in the pharmaceutical and agribusiness sectors, including our partnership with Alnylam Pharmaceuticals (NASDAQ: ALNM), a world leader in the clinical development of RNAi therapeutics." ([announced 23 May 2012](#)).

Please click [here](#) for a link to the Short RNA section on our website.

For licensing enquiries, please contact Dr Lars von Borcke (lars@pbltechnology.com).

All other enquiries to info@pbltechnology.com.

About PBL

Plant Bioscience Limited (PBL) www.pbltechnology.com is a technology development and intellectual property management company owned in equal parts by The Sainsbury Laboratory www.tsl.ac.uk, the John Innes Centre www.jic.ac.uk and the Biotechnology and Biological Sciences Research Council www.bbsrc.ac.uk. PBL promotes the development and commercial uptake of academic research results for public use and benefit and is specialised in life sciences, and in particular plant, food and microbial science.

PBL is the owner of the patent rights created by this work of Andrew Hamilton and David Baulcombe.

About The Sainsbury Laboratory

The Sainsbury Laboratory (TSL) www.tsl.ac.uk is a world-leading research centre located in Norwich, UK, focusing on making fundamental discoveries about plants and how they interact with microbes. [Professor Sir David Baulcombe](#) is now Regius Professor of Botany and Royal Society Research Professor at The University of Cambridge. [Dr Andrew Hamilton](#) is now at The University of Glasgow, in the Division of Cancer Sciences and Molecular Pathology.

About RNAi

The importance of silencing as a scientific discovery was underlined both by the award of a Nobel Prize in 2006 to Andrew Fire and Craig Mello, in recognition of their seminal publication in 1998 on the use of long dsRNA to induce silencing in nematodes, and the Lasker Foundation awarding the 2008 Albert Lasker Basic Research Award jointly to David Baulcombe (whose work demonstrated that short RNA molecules have a broad applicability as markers and inducers of gene silencing in living organisms), jointly with Gary Ruvkun and Victor Ambros (for their combined effort in identifying the first miRNA in nematodes). On issuing the award, the Lasker Foundation noted David Baulcombe's contributions thus: "[For discoveries that revealed an unanticipated world of tiny RNAs that regulate gene function in plants and animals](#)". In addition, in 2009, Professor Baulcombe was awarded a knighthood "[for services to Plant Science](#)".

The original patent application that led to the PBL RNAi patent portfolio was filed by PBL in 1999, following Baulcombe and Hamilton's ground-breaking research at The Sainsbury Laboratory in Norwich, UK and published in Science ("[A Species of Small Antisense RNA in Posttranscriptional Gene Silencing in Plants](#)", (1999), 286, pp. 950-952). This paper provided the first identification that short RNA molecules are the active agents of silencing, and the patent describes methods and compositions for use of such molecules for inducing silencing in living organisms. The PBL RNAi patent portfolio currently comprises US Patent Nos 6,753,139, 7,704,688, 8,097,710, 8,258,285, 8,263,569 and 8,299,235.

Glossary:

siRNA	short interfering RNA
SRM	short RNA molecule
miRNA	MicroRNA
dsRNA	double stranded RNA
RNAi	RNA interference

US 8,299,235 CLAIMS:

1. A composition for introduction into a cell to effect gene silencing, consisting essentially of isolated short antisense RNA molecules (SARMs) and isolated short sense RNA molecules (SSRMs), collectively short RNA molecules (SRMs), wherein the SSRMs and the SARMs consist of 21-30 nucleotides; wherein said SARMS are complementary to, and can base pair with, a target RNA, which target RNA is transcribed from a gene that is silenced when said SRMs are present in a cell containing said gene, and said SSRMs correspond to the target RNA; and wherein said gene is endogenous to an organism selected from the group consisting of a plant, a mammal, an avian organism, a reptile, an insect, and a protozoan, or said target RNA is generated by a pathogen.
2. The composition of claim 1 wherein said SRMs are unmodified.
3. The composition of claim 1 wherein each SSRM and each SARM consists of 25 nucleotides.
4. The composition of claim 1 wherein each SSRM and each SARM consists of 26 nucleotides.
5. The composition of claim 1 wherein each SSRM and each SARM consists of 27 nucleotides.
6. The composition of claim 1 wherein each SSRM and each SARM consists of 28 nucleotides
7. The composition of claim 1 wherein each SSRM and each SARM consists of 29 nucleotides.
8. The composition of claim 1 wherein each SSRM and each SARM consists of 30 nucleotides.
9. A composition for introduction into a cell to effect gene silencing, which composition comprises at least one vector which, when introduced into a cell, produces short antisense RNA molecules (SARMs) and short sense RNA molecules (SSRMs), said SARMS and SSRMs designated, collectively, short RNA molecules (SRMs), wherein the SSRMs and SARMS consist of 20-30 nucleotides; wherein said SARMS are complementary to, and can base pair with, a target RNA, which target RNA is transcribed from a gene that is silenced when said SRMs are present in a cell containing said gene, and said SSRMs correspond to the target RNA; wherein said gene is endogenous to an organism selected from the group consisting of a plant, a mammal, an avian organism, a reptile, an insect, and a protozoan, or said target RNA is generated by a pathogen.
10. The composition of claim 9 wherein each SSRM and each SARM consists of 25 nucleotides.
11. The composition of claim 9 wherein each SSRM and each SARM consists of 26 nucleotides.
12. The composition of claim 9 wherein each SSRM and each SARM consists of 27 nucleotides.
13. The composition of claim 9 wherein each SSRM and each SARM consists of 28 nucleotides.
14. The composition of claim 9 wherein each SSRM and each SARM consists of 29 nucleotides.
15. The composition of claim 9 wherein each SSRM and each SARM consists of 30 nucleotides.

Click the links below for PBL's other short RNA patent claims:

Issue Date	Issue Number	Subject Matter
11 Sep 12	8.263.569	Method of inducing silencing using short RNA molecules (20 to 30 nt)
4 Sep 12	8.258.285	Compositions (including vectors) to effect gene silencing through short RNA molecules (20 to 24 nt)
17 Jan 12	8.097.710	Methods for causing gene silencing in a cell
27 Apr 10	7.704.688	Methods are disclosed for screening for the occurrence of gene silencing (e.g. post transcriptional gene silencing) in mammals
22 Jun 04	6.753.139	Methods are disclosed for screening for the occurrence of gene silencing (e.g. post transcriptional gene silencing) in plants