

## Title (en)

METHODS FOR DETERMINATION OF SINGLE NUCLEIC ACID POLYMORPHISMS USING A BIOELECTRONIC MICROCHIP

## Title (de)

METHODEN ZUR BESTIMMUNG VON EINZELNUKLEOTIDPOLYMORPHISMEN DURCH VERWENDUNG EINES BIOELEKTRONISCHEN MIKROCHIPS

## Title (fr)

PROCEDES DE DETERMINATION DE POLYMORPHISMES SINGULIERS DE NUCLEOTIDES A L'AIDE D'UNE PUCE BIOELECTRIQUE

## Publication

**EP 1173611 A4 20030115 (EN)**

## Application

**EP 00918506 A 20000328**

## Priority

- US 0008432 W 20000328
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## Abstract (en)

[origin: WO0061805A1] Methods are provided for the analysis and determination of the nature of single nucleic acid polymorphisms (SNPs) in a genetic target. In one method of this invention, the nature of the SNPs in the genetic target is determined by the steps of providing a plurality of hybridization complexes arrayed on a plurality of test sites on an electronically bioactive microchip, where the hybridization complex includes at least a nucleic acid target containing an SNP, a stabilizer probe having a sequence complementary to the target sequence and/or reporter probe, and a reporter probe having a selected sequence complementary to either the stabilizer or the same target sequence strand wherein a selected sequence of the reporter includes either a wild type nucleotide or a nucleotide corresponding to the SNP of the target. In accordance with the invention, the stabilizer, reporter and target amplicons are hybridized using electronic assistance of the microchip system such that base-stacking energies are utilized in discerning among other identifying indicators, the presence of wild type or polymorphism sequence. Applications include disease diagnostics, such as for the identification of polymorphisms in structural genes, regulatory regions, antibiotic or chemotherapeutic resistance conferring regions, or for SNPs associated with speciation or used for determination of genetic linkage.

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## Citation (search report)

- [XPXY] WO 9943853 A1 19990902 - NANOGEN INC [US]
- [Y] US 5795714 A 19980818 - CANTOR CHARLES R [US], et al
- [DY] US 5770365 A 19980623 - LANE MICHAEL J [US], et al
- [Y] US 5605662 A 19970225 - HELLER MICHAEL J [US], et al
- [PY] US 6017696 A 20000125 - HELLER MICHAEL J [US]
- [Y] BROUDE N E ET AL: "ENHANCED DNA SEQUENCING BY HYBRIDIZATION", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 91, 1 April 1994 (1994-04-01), pages 3072 - 3076, XP000619675, ISSN: 0027-8424
- [Y] EDMAN C F ET AL: "Electric field directed nucleic acid hybridization on microchips", NUCLEIC ACIDS RESEARCH, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 25, no. 24, 1997, pages 4907 - 14, XP002165640, ISSN: 0305-1048
- [Y] MALDONADO-RODRIGUEZ R ET AL: "MUTATION DETECTION BY STACKING HYBRIDIZATION ON GENOSENSOR ARRAYS", MOLECULAR BIOTECHNOLOGY, TOTOWA, NJ, US, vol. 1, no. 11, February 1999 (1999-02-01), pages 13 - 25, XP001079089, ISSN: 1073-6085
- [Y] MALDONADO-RODRIGUEZ R ET AL: "HYBRIDIZATION OF GLASS-TETHERED OLIGONUCLEOTIDE PROBES TO TARGET STRANDS PREANNEALED WITH LABELED AUXILIARY OLIGONUCLEOTIDES", MOLECULAR BIOTECHNOLOGY, TOTOWA, NJ, US, vol. 11, no. 1, February 1999 (1999-02-01), pages 1 - 12, XP000985207, ISSN: 1073-6085
- [DY] YERSHOV G ET AL: "DNA ANALYSIS AND DIAGNOSTICS ON OLIGONUCLEOTIDE MICROCHIPS", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 93, 1 May 1996 (1996-05-01), pages 4913 - 4918, XP000196978, ISSN: 0027-8424
- [DY] PARINOV S AT AL: "DNA sequencing by hybridization to microchip octa- and decanucleotides extended by stack pentanucleotides", NUCLEIC ACIDS RESEARCH, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 24, no. 15, 1 August 1996 (1996-08-01), pages 2998 - 3004, XP002201636, ISSN: 0305-1048
- See references of WO 0061805A1

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