microRNAs
- developing new tools for diagnostics -

Join forces with IMGM Laboratories to make your miRNA project a success

Dr. Carola Wagner
IMGM Laboratories GmbH
Martinsried, Germany

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Agenda

• IMGM - your outsourcing partner (in brief)
• Our service portfolio (in brief)
• miRNA in diagnostics
• workflow: microarray-based miRNA profiling
• Summary
IMGM Laboratories – your outsourcing partner

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IMGM – your outsourcing partner
some basic facts

• IMGM Laboratories was founded in 2001
• We are located on the biotech campus Martinsried / Munich
• We operate as service provider offering advanced genomic services
• Our customers come from academia, pharma and biotech
• A flexible and reliable partnership (e.g. small and dedicated team)

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IMGM - your outsourcing partner

some basic facts

• strategic partnership with the “Center for human genetics and laboratory medicine Dr. Klein & Dr. Rost”

• full accreditation according to DIN EN ISO/IEC 17025

• full accreditation for expression analysis based on whole genome microarrays and quantitative real-time PCR

• Agilent Certified Service Provider
RNA services:

- **Microarrays** (Agilent platform, multiple options)
- **Real-Time PCR** (AB 7900HT, TaqMan arrays, 96- and 384-well blocks, gene expression studies)
- **microRNA profiling**
- **RNA isolation**
- **RNA quality control** (Agilent Bioanalyzer | Nanodrop)
microRNAs and their potential in diagnostics

miRNAs in diagnostics

miRNAs / miRNA profiles:

• **association to ~ 70 diseases**  
  (HMDD, human microRNA disease database, last update 2008-10-17)

• **active players in human oncogenesis**  
  e.g. miR-21 onco-miRNA for breast cancer (Qian et al. (2008) Breast Cancer Res Treat; c.f. Sassen et al. (2008) Virchows Arch 452:1-10)

• **classify human cancers**  
  e.g. Lu et al. (2005) Nature 435:834-838  
  Volinia et al. (2006) Proc Natl Acad Sci USA 103:2257-2261
miRNAs in diagnostics

miRNAs / miRNA profiles associated with:

- **disease prognosis:**
  - miR-221/222 cluster associated with poor prognosis in thyroid papillary carcinomas, pancreatic adenocarcinoma & glioblastoma (Lesage et al. (2007) Cell Cycle 6)

- **prognosis of therapy outcome and response**

Actual examples of miRNA diagnostic tests:

- **Chronic pancreatitis vs. pancreatic cancer** (Asuragen)
- **Prediction of colon cancer** (launch early 2009, Exiqon A/S)
- **Differentiation of mesothelioma from other cancers** (miRview meso, Rosetta Genomics)
- **Identification of squamous-type lung cancers** (miRview squam, Rosetta Genomics)
- **Identification of tissue-of-origin of metastatic tumors** (miRview mets, Rosetta Genomics)
Possibilities for **YOU** to join the field of miRNA research !!!

**miRNA profiling**

the general workflow

- **Sample Size**
- **Project Consulting**
- **Sample Preparation**
- **Quality Control**
- **Agilent DNA Microarrays**

- **Catalog/Custom Arrays**

- **Functional analysis**
- **miRNA mimic or inhibition**
- **Hit Validation with qPCR**
- **Bioinformatic Data Analysis**

- e.g. mRNa microarrays (G Ex)
- **Customer**
- **AB7900HT/TLDAs**
- **Deregulated Genes**
miRNA profiling

Sample preparation

Sample types:
- Cells
- Tissues
- Blood and PBMCs
- FFPE
  - e.g. Li et al. (2007) BMC Biotechnology 7:30
  - Xi et al. (2007) RNA 13:1668-1674
- Body fluids
  - e.g. serum, urine, saliva, amniotic fluid, pleural fluid
  - e.g. Chen et al. (2008) Cell Research 18:997-1006

(mi)RNA quality control & quantification

www.agilent.com/chem/labonchip
miRNA profiling
e.g. Agilent Microarray Workflow

Total RNA incl. small RNAs (100ng)
- direct RNA 3'end Labeling with Cy3-pCp
- Labeled RNAs
- hybridization on microarrays
- miRNA profile
miRNA profiling
Data analysis

Sample treated
log2 data

Collaborative work with SIRION BIO TECH:
Thirion et al. (2009) qPCR 2009 – RNAi:
microRNA – siRNA applications

Sample untreated
log2 data
miRNA profiling
Hit validation by qPCR

Collaborative work with SIRION BIOTECH:
Thirion et al. (2009) qPCR 2009 – RNAi: microRNA – siRNA applications

* p<0.05
** p<0.01

miRNA profiling
e.g. functional analysis by mRNA expression profiling

mRNA profiling = gene expression analysis
Summary

Single miRNAs / miRNA profiles in relation to diagnostics:
• Well established miRNA technologies
• Increased number of publications with promising results
• First diagnostic tests launched

miRNA research for you powered by IMGM laboratories:
• Advanced genomic services with one focus on RNA services and miRNA services
• State-of-the-art technology to provide top-quality data
• Full accreditation – especially for microarray- and qPCR-based expression analysis
• Sound bioinformatics to extract meaningful results
• Expert knowledge in molecular genetics and medical diagnostics

Thank you very much for your attention!

We are open for business...

The IMGM Laboratories Team
www.imgm.com