

Pathways Between Industry and Academia

Information Day on the Marie Curie IAPP Scheme

Science Gallery, Pearse Street, Dublin 1 [7th April 2009]

From Target-Breast to Target-Melanoma



Prof. William M. Gallagher
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University College Dublin

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OncoMark Ltd.

Mr. Steve Penney
CFO/COO, OncoMark Ltd.

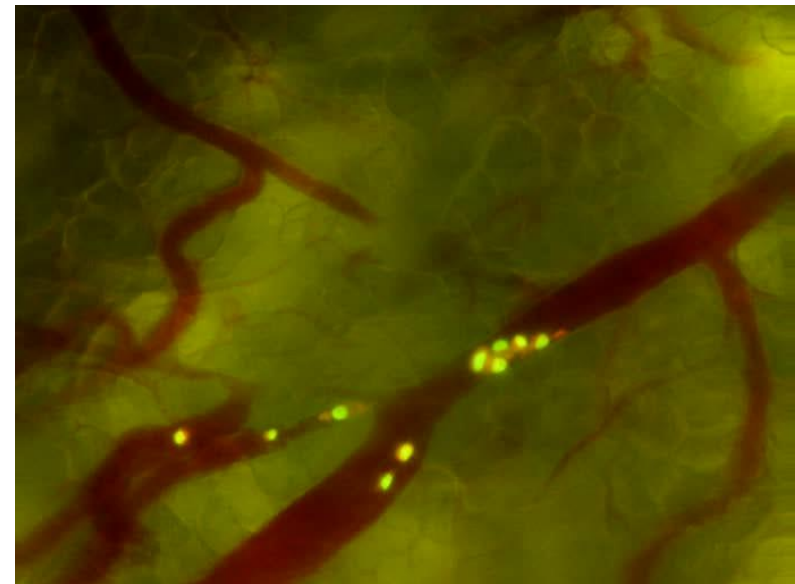
- **Spin-out from UCD**
- **Founded in May 2007**
- **Focus:** Development and application of novel biomarker panels, and associated technologies, on both tissue and biological fluids
- **Services:**
 - *Digital slide scanning*
 - *Tissue microarray construction*
 - Consultancy (combined scientific/financial perspective)
- **Product development:**
 - *Novel image analysis toolkit for quantitating biomarker expression in tissues assessed by immunohistochemistry*



www.oncomark.com

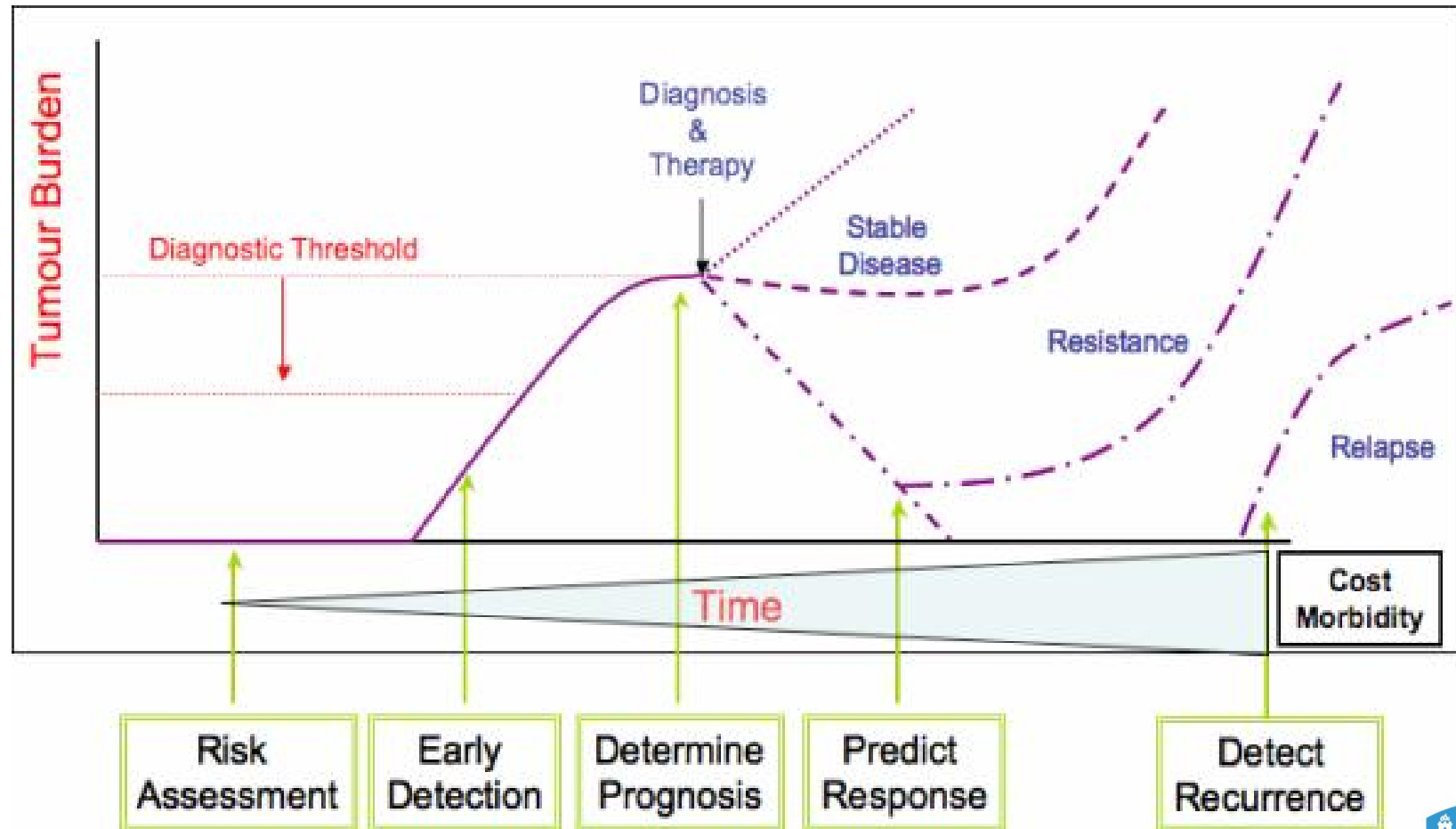


Tumour Growth and Spread

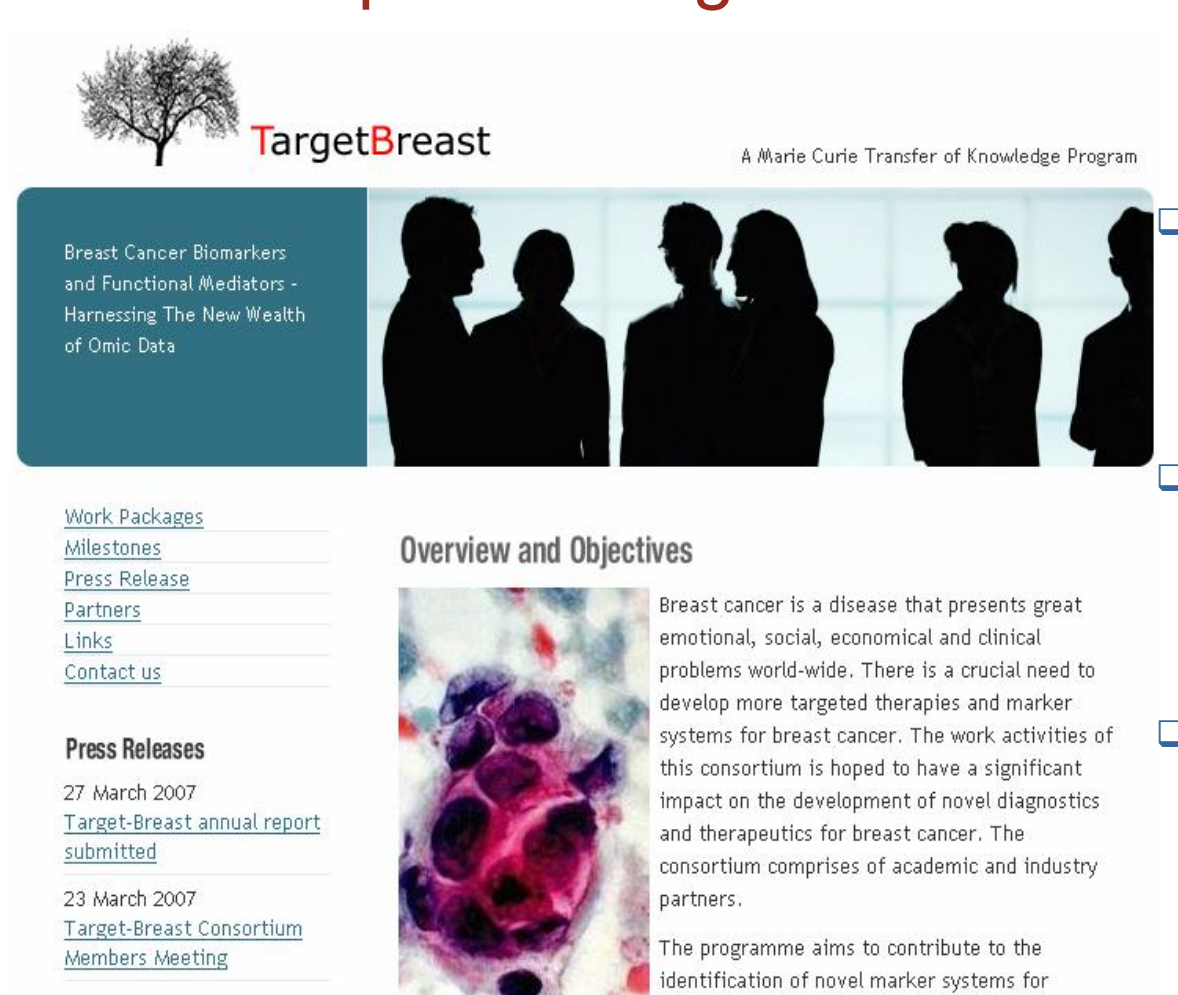


Intravital Microscopy
HT1080 fibrosarcoma tumour cells
Courtesy of Prof. Robert Hoffman
(Anti-Cancer Inc.)

Biomarkers in Cancer Management



Target-Breast: Marie Curie Industry-Academia Partnership ToK Programme



The screenshot shows the TargetBreast website. At the top left is a tree logo and the text 'TargetBreast'. To the right is the text 'A Marie Curie Transfer of Knowledge Program'. Below this is a banner image showing silhouettes of people. On the left side of the banner is a teal box with the text 'Breast Cancer Biomarkers and Functional Mediators - Harnessing The New Wealth of Omic Data'. Below the banner is a sidebar with links: 'Work Packages', 'Milestones', 'Press Release', 'Partners', 'Links', 'Contact us', and 'Press Releases'. The 'Press Releases' section lists two items: '27 March 2007 Target-Breast annual report submitted' and '23 March 2007 Target-Breast Consortium Members Meeting'. To the right of the sidebar is a section titled 'Overview and Objectives' with a microscopic image of cells and text describing the consortium's goals.

TargetBreast

A Marie Curie Transfer of Knowledge Program

Breast Cancer Biomarkers and Functional Mediators - Harnessing The New Wealth of Omic Data

Work Packages
Milestones
Press Release
Partners
Links
Contact us

Press Releases

27 March 2007
[Target-Breast annual report submitted](#)

23 March 2007
[Target-Breast Consortium Members Meeting](#)

Overview and Objectives

Breast cancer is a disease that presents great emotional, social, economical and clinical problems world-wide. There is a crucial need to develop more targeted therapies and marker systems for breast cancer. The work activities of this consortium is hoped to have a significant impact on the development of novel diagnostics and therapeutics for breast cancer. The consortium comprises of academic and industry partners.

The programme aims to contribute to the identification of novel marker systems for



3 academic centres

- UCD
- Lund U.
- NKI

2 industrial partners

- SlidePath
- Agendia

Focus on converting omic datasets into clinically relevant assays

www.targetbreast.com



Lessons Learned and Comments

- Programme was of considerable value to consolidate and strengthen pre-existing/new industry-academic interactions
- Provided great opportunities for advanced training of researchers in different sectors
- Administration of programme complex, with reporting process difficult in parts (e.g. ambiguous nature of online versus hard copy submissions, EC timeline for sign-off of Annual report – delay of funds)
- Turnover of contact staff at EC appears to be quite high; therefore, difficult to maintain relationship
- Difficult to recruit good candidates for exchanges: ‘best laid plans!’
- Support for proposal preparation was key to drive process (Enterprise Ireland), as well as feedback/advice from Marie Curie/FP contact points (Dagmar Meyer/Caitriona Creely)
- Need complete buy-in from prospective partners – interactions need to make sense
- Need to identify key driver in the process for next initiative (in my case, the next speaker!)



Target-Melanoma

Industry-Academia Partnership and
Pathways Programme

Dr. Mairin Rafferty, BSc PhD
UCD Conway Institute, University
College Dublin



IAPP Project

- Acronym: **Target-Melanoma**
- Title: **Molecular Dissection of Melanoma Progression: An Integrated Pan-European Approach**
- Partners: **9 partners (4 SMEs, 5 Academics)**
- Funding: **1.7 M euro**



Partners

Academic

1. **UCD, Ireland**
 2. **University of Maastricht, Netherlands**
 3. **University of Leuven, Belgium**
 4. **IDIBELL, Spain**
 5. **University of Uppsala, HPR, Sweden**
-

SME

6. **OncoMethylome, Belgium**
7. **Slidepath, DCU, Ireland**
8. **Cellix, St.James, Ireland**
9. **OncoMark, UCD, Ireland**



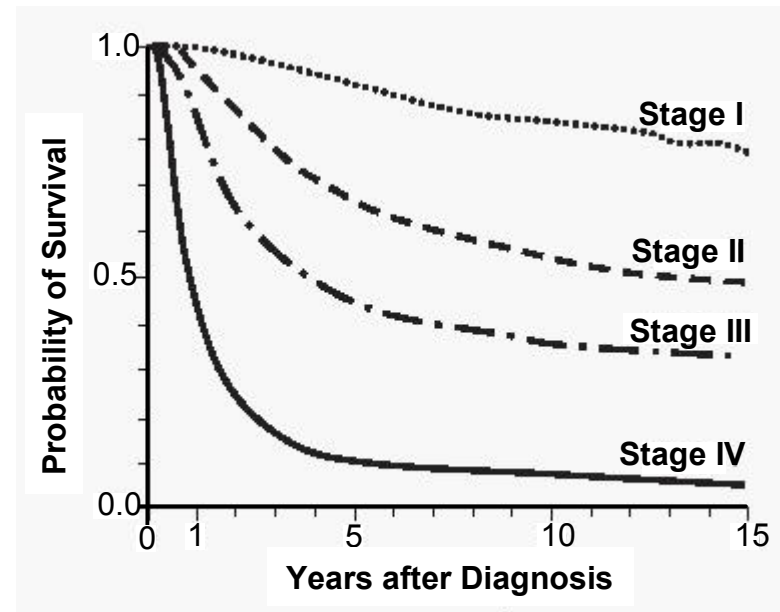
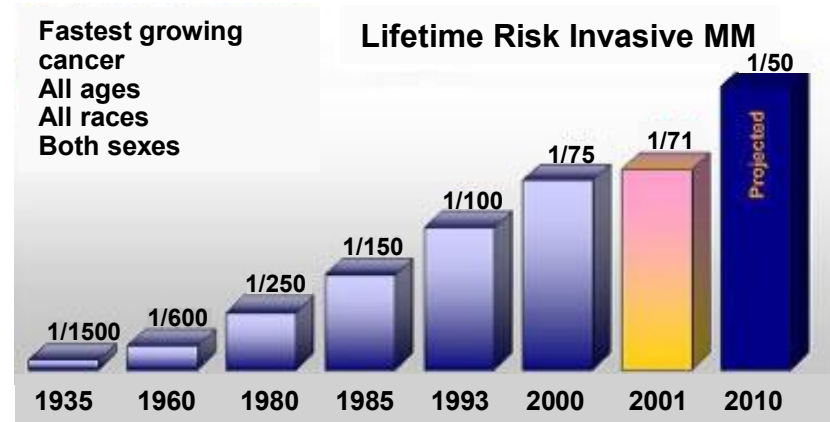
Science and Technology

- Science Background
- Aims
- Workpackages



Why Melanoma?

- Malignant tumour of the melanocytes
- Incidences are rising rapidly
- 5% skin cancer, 75% skin cancer death
- Early lesions are curative with surgical removal
- Poor prognosis for advanced metastasis
- Chemo or other therapy gives no benefit to survival of patients



Aims

Focus on harnessing of high-throughput approaches to identify and validate new melanoma biomarkers

1. Identification genes that are turned-off via DNA methylation during melanoma progression
2. Profiling methylation of these genes in extensive cohorts of melanoma tissues
3. Analysis of protein biomarkers on tissue microarrays (TMAs)
4. *In vitro* analysis of genes in relation to function



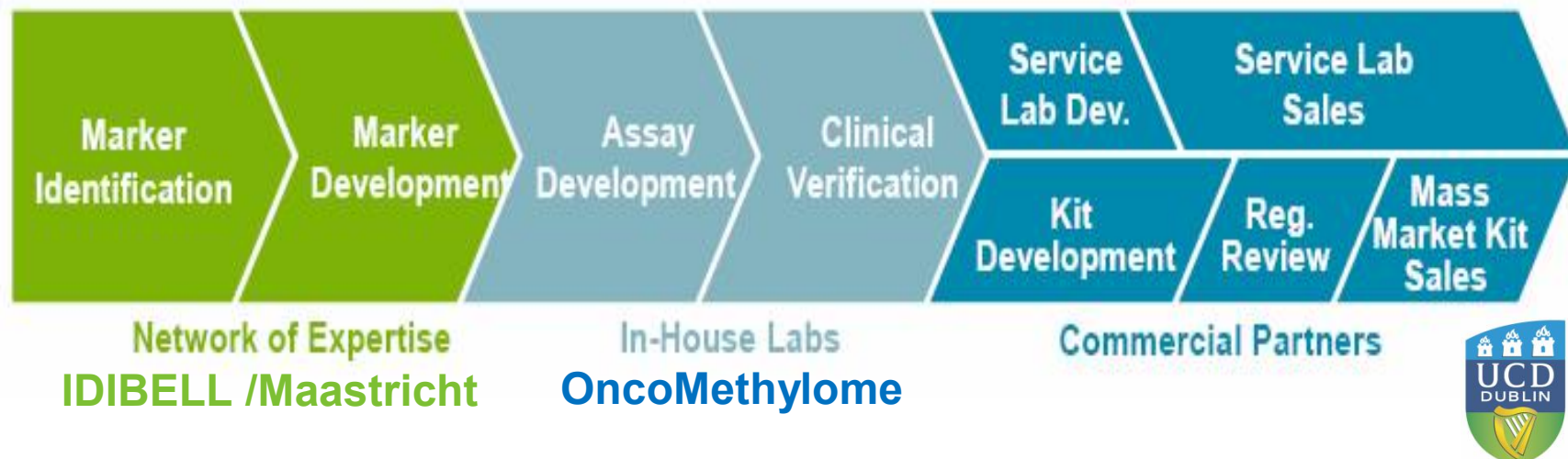
1: Identification of methylated genes

- **Dr. Manel Esteller (IDIBELL)**
 - DNA methylation expert, previous collaboration with UCD
 - 2 High-throughput technologies available:
MeDIP-ON-CHIP and Illumina to detect methylated genes
- **Dr. Van Engeland/Dr. Winnepenninckx (U. Maastricht)**
 - Pathologists, interest in DNA methylation in melanoma
 - DNA microarray study on 86 fresh frozen melanomas
 - *In silico* analysis on this study to predict methylated genes
- Melanoma samples: **UCD, Maastricht, Leuven**

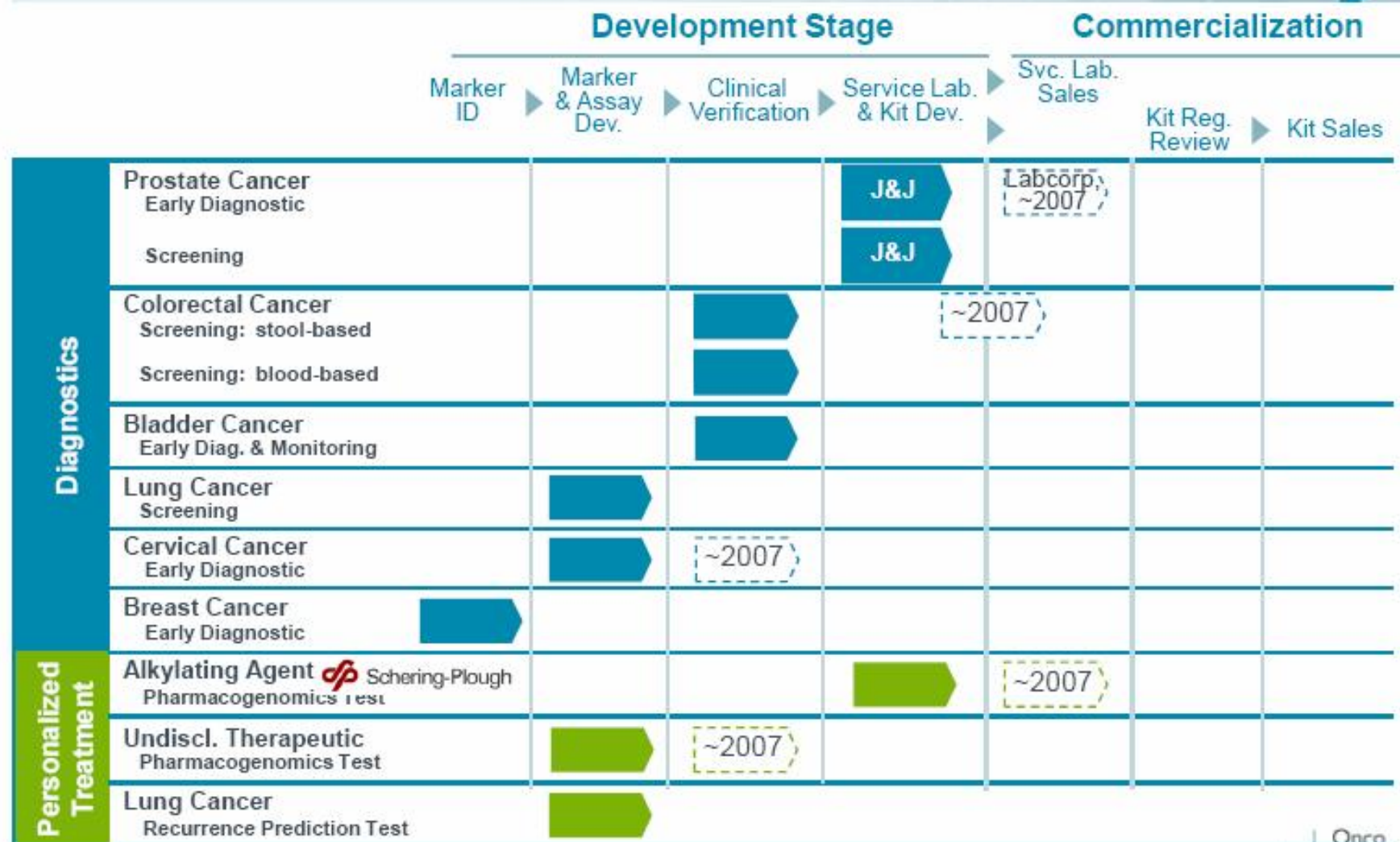


2. Methylation profiling in melanoma

- **OncoMethylome**, SME in Belgium
 - Molecular diagnostics company, developing DNA methylation tests for cancer
 - Previous interactions with UCD, IDIBELL and Maastricht
 - Can screen 48 samples for 64 methylated genes in one assay (3,072 assays)

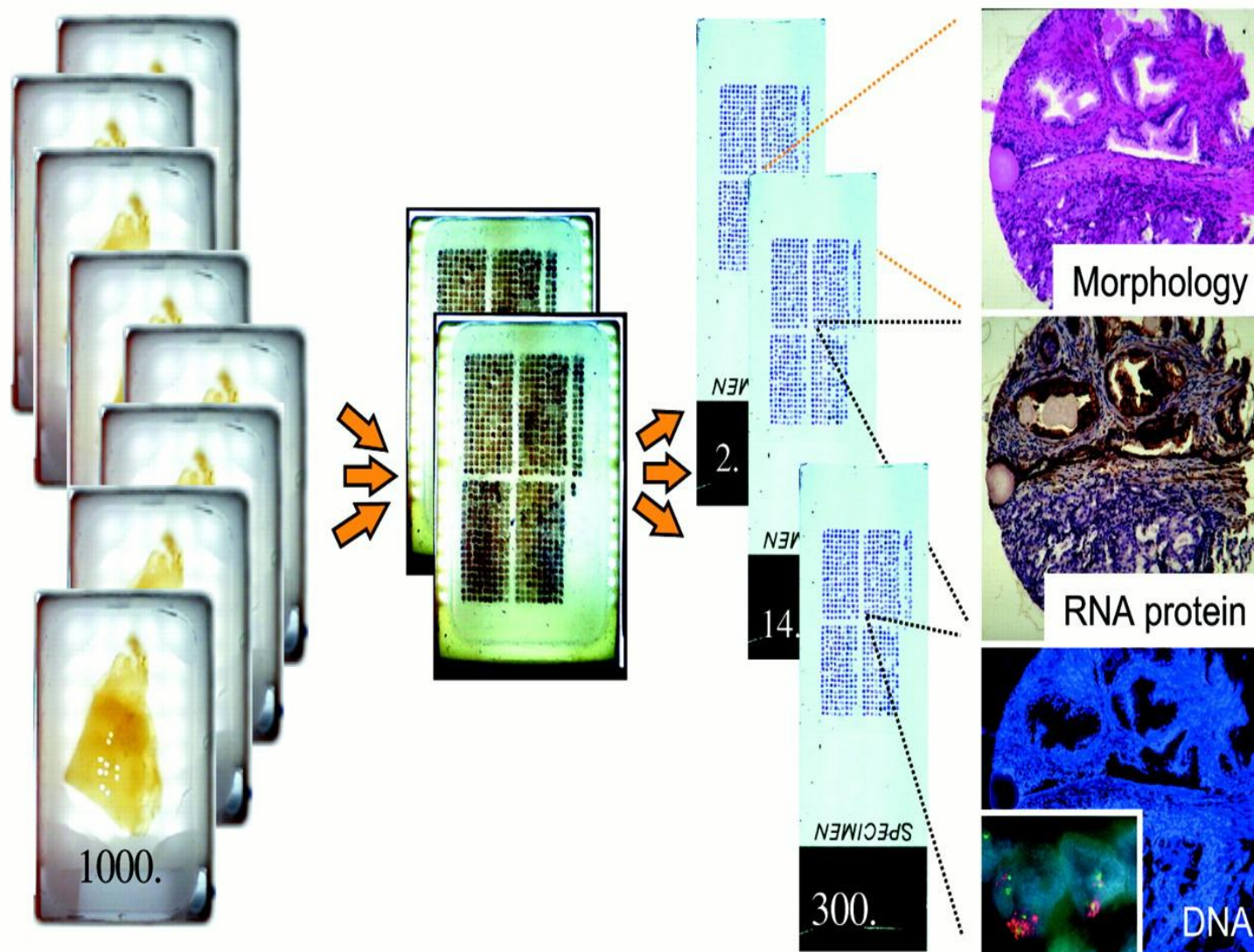


OncoMethylome Product Pipeline



The Schering-Plough® name and S-P Logo® are federally registered trademarks of Schering Corporation, used with permission.

3. Analysis of biomarkers on tissue microarrays (TMAs)



- **Human Protein Resource (Uppsala University)**

- Creating antibodies for all known proteins, interaction with UCD
- Will allow access to antibodies for melanoma project

- **OncoMark, Start-up company from UCD**

- Will create TMAs for melanoma project
- Will use antibodies to check for protein expression on TMAs

- **Slidepath, SME, based in DCU**

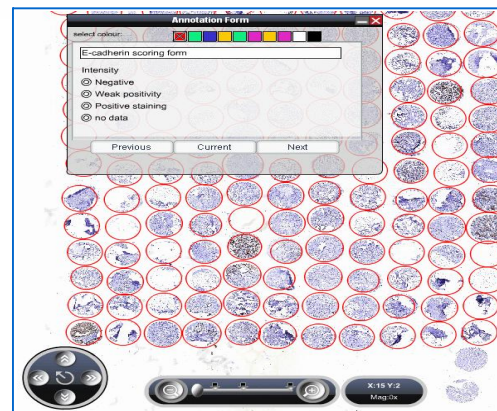
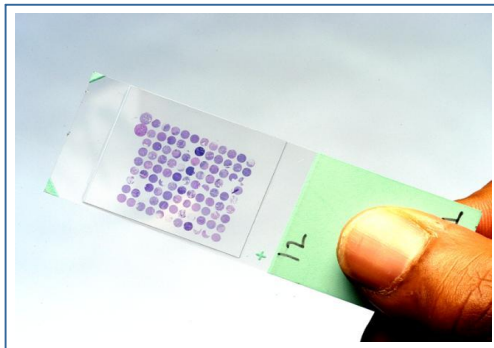
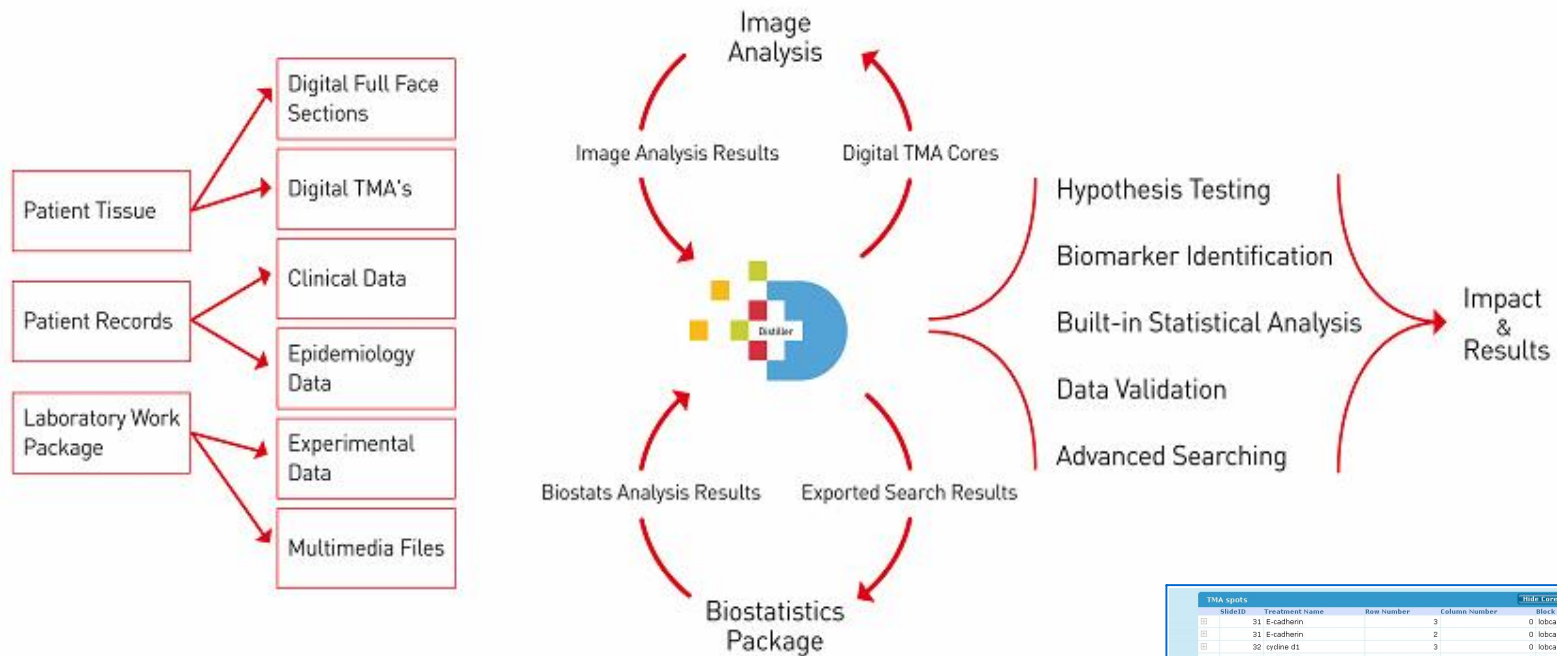
- Digital Slide and Clinical Data Management
- Automated image analysis of TMAs





SlidePath

Digital Slide Solutions



TMA spots					Hide Colors	Change View
SlideID	Treatment Name	Row Number	Column Number	Block Reference		
31	E-cadherin	3	0	lobca01		
31	E-cadherin	2	0	lobca01		
32	cycline d1	3	0	lobca01		
32	cycline d1	2	0	lobca01		
33	h67	3	0	lobca01		
33	h67	2	0	lobca01		
35	HTX	3	0	lobca01		
35	HTX	2	0	lobca01		
47	E-cadherin	3	0	lobca11		
47	E-cadherin	2	0	lobca11		
45	E-cadherin	2	0	lobca07		
45	E-cadherin	3	0	lobca07		

Consolidated scores at Patient Record level for E-cadherin

Intensity no data

1/32

VIRTUAL TMA CORES

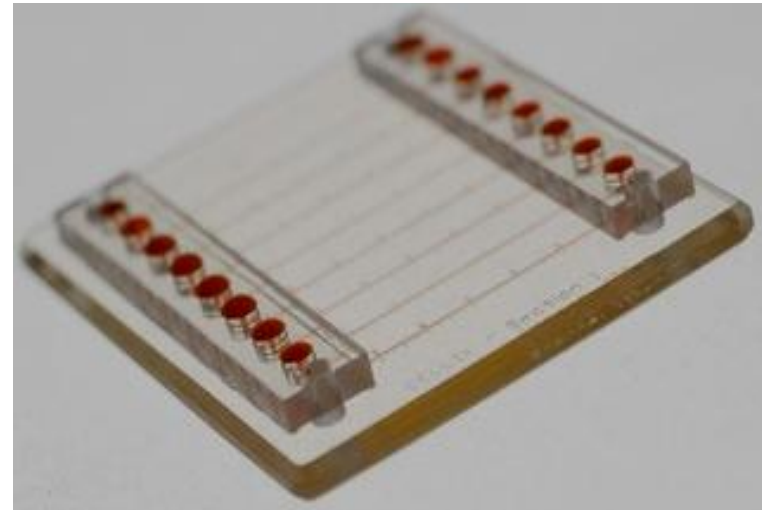
E-cadherin

HTX

cycline d1

4. *In vitro* analysis of genes in relation to function

- **Cellix**, SME, based at the IMM, TCD
 - Have developed system to mimic capillaries *in vitro*
 - Flow melanoma cells through to see if they stick – just like a metastasis in the body
- **Prof. Gallagher (UCD)**
 - Will modify genes in melanoma cells and test on this system

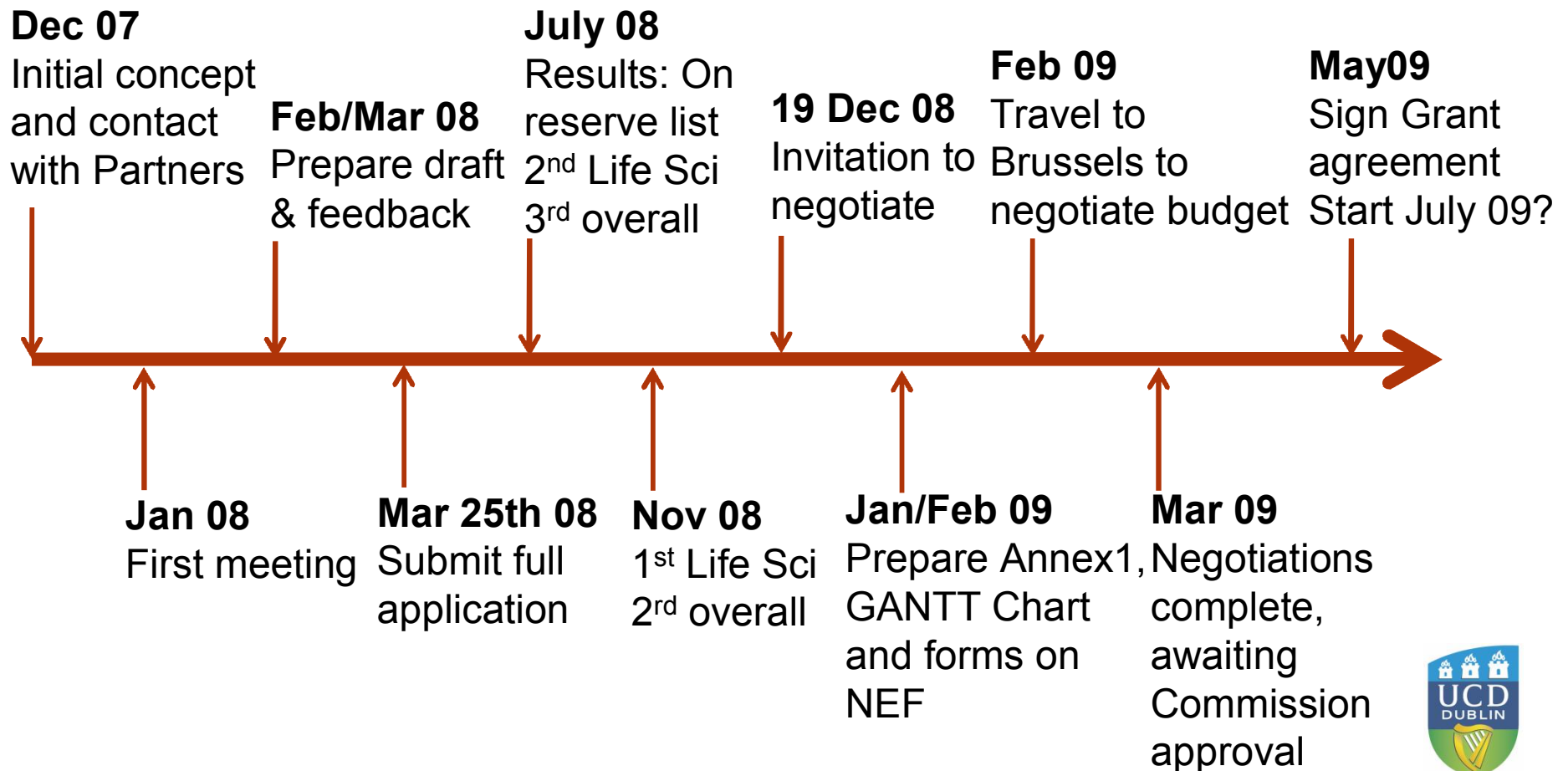


Target-Melanoma IAPP Application

- Initial Meeting
- Preparation of draft
- Secondments/Recruitments
- Budget
- Evaluation
- Negotiation



Timeline



Initial Meeting

- **Funding**

- FP7 Support for Coordinators from EI, €15K [Thank you!]

- **Each potential partner completed a Collaborator Form**

- Overview, main activities, technology and resources
- Key Personnel available for secondment, Training provided
- Publications, abstracts, conferences, webpages, patents

- **Initial Meeting**

- Each presented current research and resources
- Existing interactions
- Discussed project Aims and WPs
- Available personnel



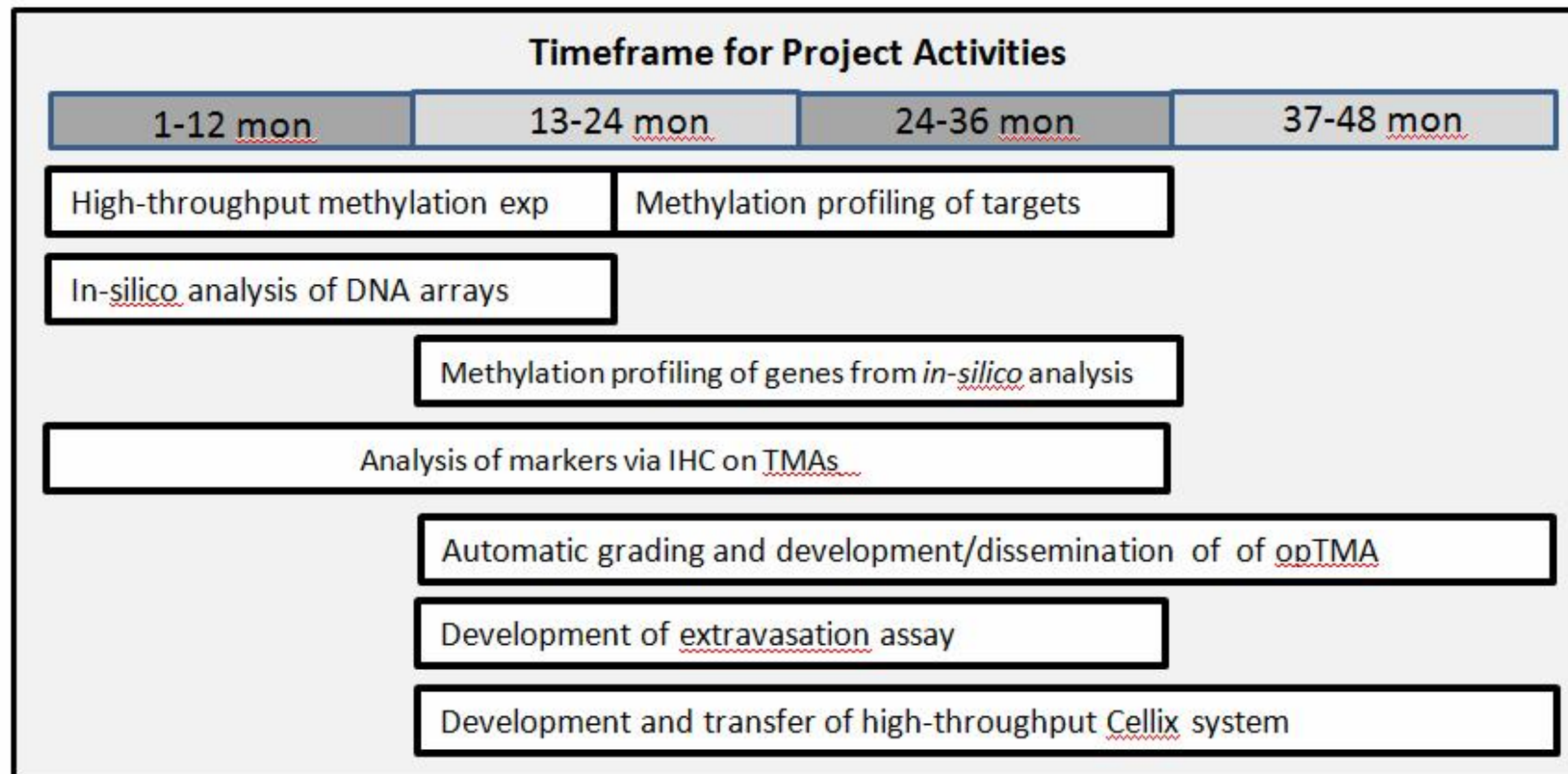
Preparation of Draft

Science and Technology

- Workplan was divided into 4 WPs, with 2-4 Tasks
- Methodology and experiments described
- Resources and technology of each participant outlined
- Start date and length of each WP
- Recruitment/Secondment plan for each WP developed
 - What current staff are willing to travel for secondment?
 - Are new recruited staff required?
 - Personnel then matched to different Tasks



Timeline for Work Activities



Recruitments

Host	1												2												3												4												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
IDIBELL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																																
OncoMark																																																	
SlidePath																																																	
Cellix																																																	

- 4 recruitments of Experienced Researchers (>4yrs)
- Duration: 18M to 24M
- All starting Year 1 or 2
- Recruitment < Secondments

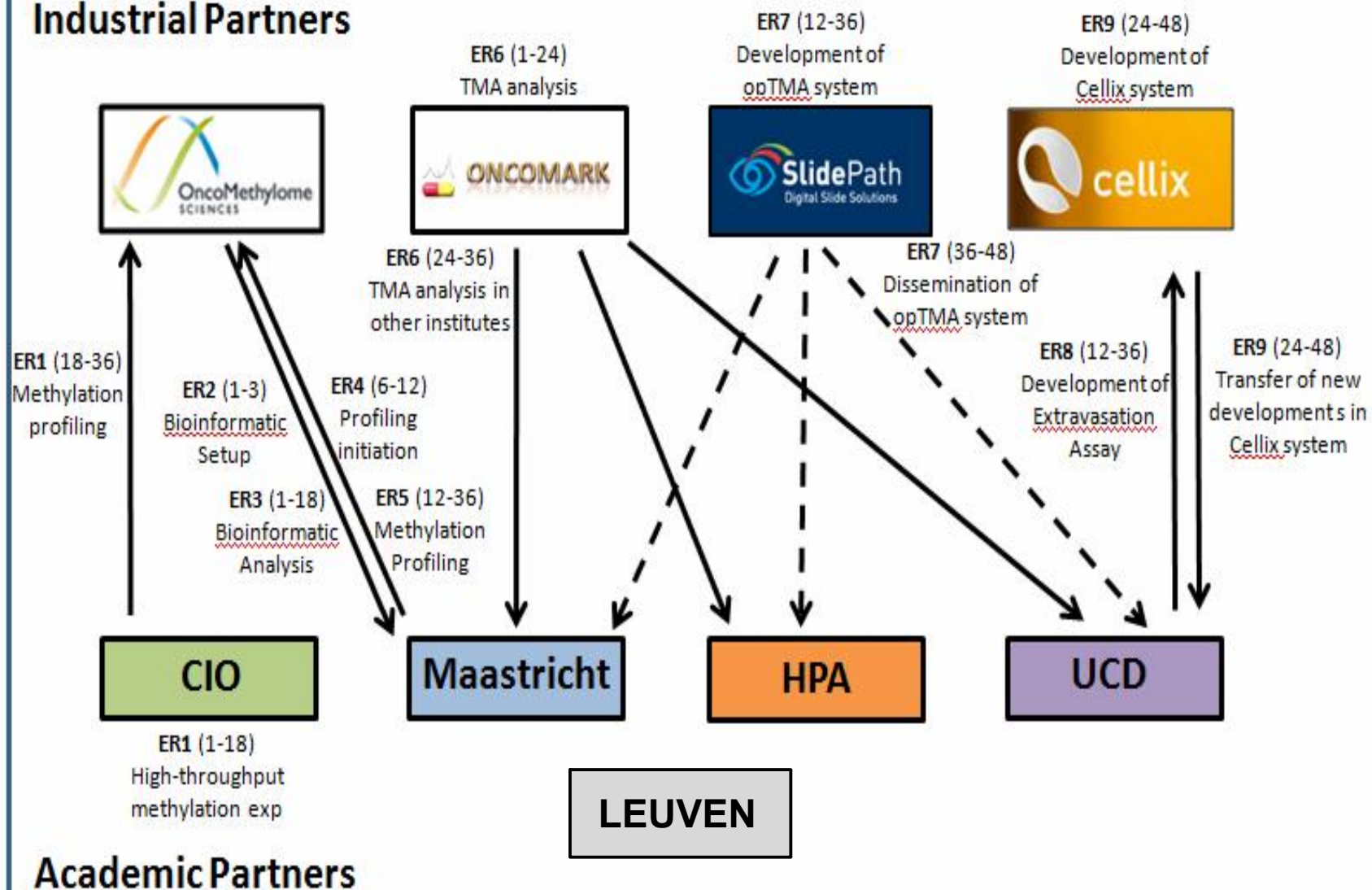
Secondments

		1												2												3												4														
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
Home Institution	Host	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48			
NUID UCD	OncoMark	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3																												
IDIBELL	ONCO																		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																	
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ONCO	UM												1	1	1	1	1	1								1	1	1	1	1	1						1	1	1	1	1	1										
Slidepath	UM																																3	3	3	3																
Slidepath	NUID UCD																																																			
Slidepath	UU																																																			
Cellix	NUID UCD	4	4	4	4	4	4	4	4	4	4	4	4																																							
OncoMark	UM																										3	3	3	3																						
OncoMark	NUID UCD																																																			
OncoMark	UU																																																			

4/9 People have been identified for secondments



Industrial Partners



Budget

- Budget is based on Person Months in Gantt Chart.
- Overall **219 PM (90PM for REC and 129PM for SEC)**
- All salaries paid by **HOST** not parent institution

Partner	PM hosted	Other	TOTAL
UCD	20	30k (conference)	173k
Maastricht	29		200k
Leuven	0		-
Uppsalla	8		60k
IDIBELL	18		120k
ONCO	48		320k
Slidepath	24	20k (equip)	200k
Cellix	24	20k (equip)	200k
OncoMark	48	46k (equip)	460k



Submission

- Overall document was 40 pages (including 2 appendix, references and 5 publications per partner)
- Online submission system
 - Register application (at least 2 weeks prior to submission)
 - Coordinator receives username/password
 - Each partner must complete A forms online
 - PIC number was not necessary at this stage
 - Upload PDF version of Part B
 - Recommend to submit several times prior to deadline



Evaluation Report

Evaluation Criteria	Mark	Weaknesses of Target Melanoma:
S & T Quality (3/5)	4.0 / 5	Need better contingency plan
Transfer of Knowledge (3/5)	3.8 / 5	Training programme lacks detail
Implementation (3/5)	4.5 / 5	Should include external advisors
Impact (0/5)	4.2 / 5	Describe potential impact of specific results/milestones of project
Overall (over 70%)	82.9%	

Invitation to Negotiation

- **ANNEX 1**

- Summary of project, project reviews and milestones
- WPs, Fellows involved and Risk analysis

- **GANTT CHART**

- Outline of all rec/sec between Parent and Host institutions
- Other detail (Marital status, experience, start/end month, contract Type and WP)

- **A-FORMS:** Completed online



Negotiation

- **NB: PIC number**
 - All participants must be registered and have PIC number
 - Can take >6 months, unless on PRIORITY list
 - Can still cause delays (2 month delay for Target-Melanoma)
- Currently preparing CONSORTIUM AGREEMENT
- Awaiting for Commission, next step is to sign off grant agreement and start project



Acknowledgements



Collaborators/External Assistance

Dr. Shauna Hegarty, Queens University, Belfast

Dr. Kieran Sheahan, SVUH, Dublin

Mr. Enda Mc Dermott, SVUH, Dublin

Dr. Ian Murphy, SVUH, Dublin

Dr. Maire Lavelle, SVUH, Dublin

Dr. Fredrik Ponten, Uppsala University

Dr. Sara Stromberg, Uppsala University

Dr. Manel Esteller, IDIBELL, Barcelona, Spain

Dr. Isobel de Lopez, IDIBELL, Barcelona, Spain

Dr. Manon van Engeland, Maastricht, Netherlands

Dr. V. Winnepenninckx, Maastricht, Netherlands

Prof Joost van den Oord, Leuven, Belgium

Joost Louwagie, OncoMethylome Sciences, Belgium

Dr. Donal O'Shea, SlidePath Inc, Dublin

Dr. Lynne Dobson, SlidePath Inc., Dublin

Ms. Vivienne Williams. Cellix Ltd, Dublin

Prof. Robert Millikan, UNC at Chapel Hill, North Carolina

The Gallagher Laboratory

Dr. Mairin Rafferty, Post-Doctoral Fellow

Dr. Darran O'Connor, Post-Doctoral Fellow

Dr. Radoslaw Zagozdzon, Post-Doctoral Fellow

Dr. Karen Power, Post-Doctoral Fellow

Dr. Kate Fitzgerald, Post-Doctoral Fellow

Dr. Donal Brennan, Post-Doctoral Fellow

William Faller, PhD student

Denise Ryan, PhD student

Gabriela Gremel, PhD student

Elton Rexhepaj, PhD student

Ben Collins, PhD student

Karen Power, PhD student

Thomas Lau, PhD student

Fiona Lanigan, PhD student

Aisling O'Connor, PhD student

Laoighse Mulrane, PhD student

Henrietta Laursen, PhD student

Kirsha Naiker PhD student

Rut Klinger PhD student

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