



Genoma España



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Plataformas de apoyo a la investigación: biobancos y centros de recursos biológicos

Jornadas:

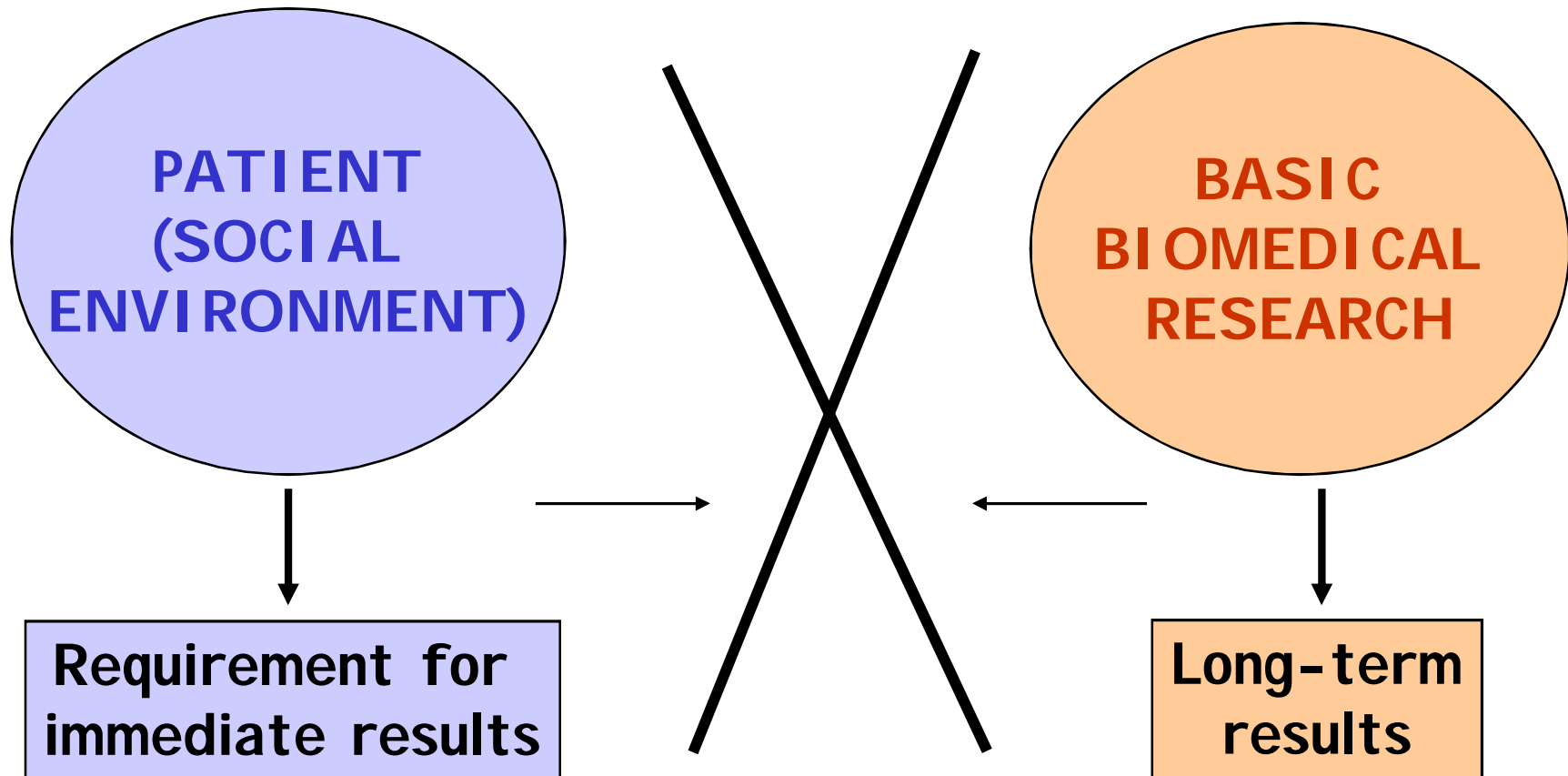
**“La realidad de los biobancos a la luz del nuevo marco
normativo: retos e implicaciones”**

*Centro de Investigación del Cáncer
Madrid, 16 de diciembre de 2009*

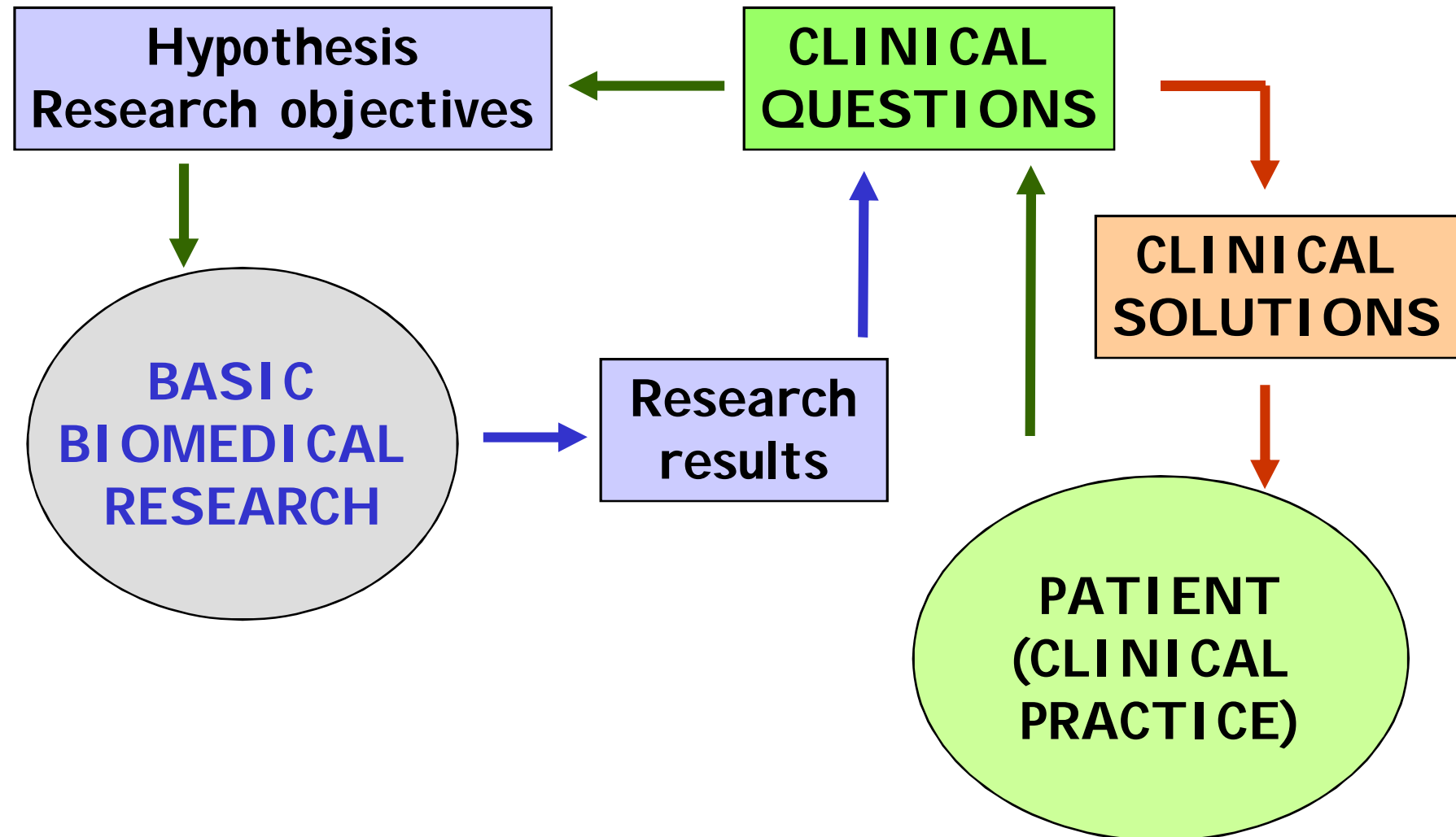


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SOCIAL REQUIREMENTS FOR SUPPORTING RESEARCH: THE DELAYING FACTOR



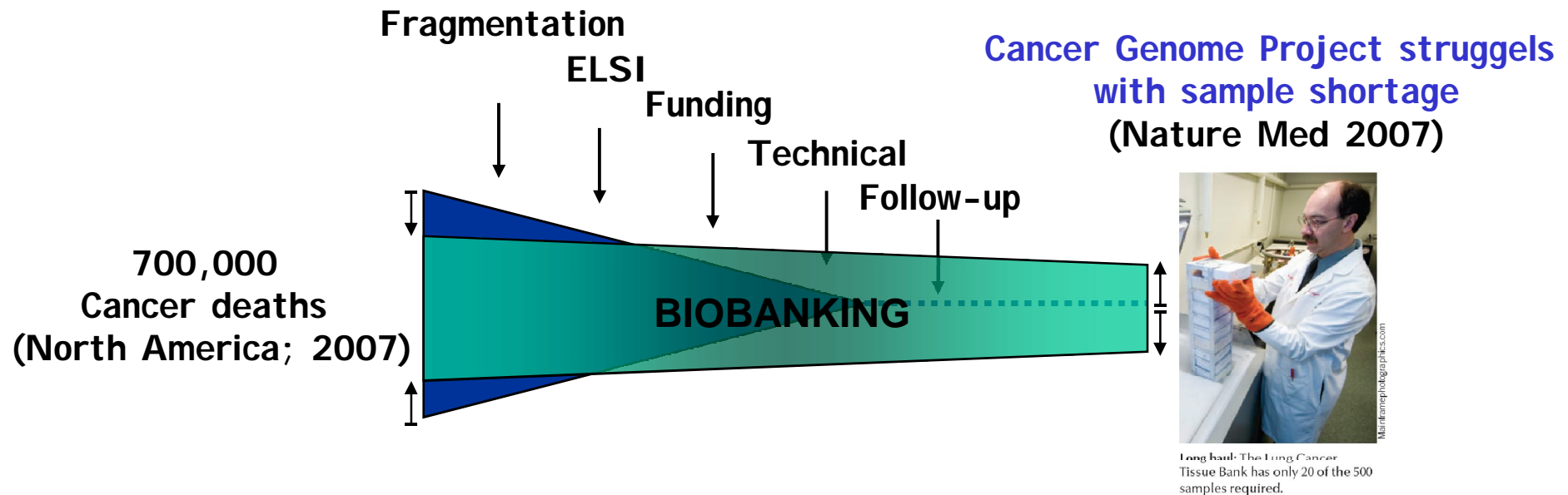
TRANSLATIONAL RESEARCH ENVIRONMENT



CRITICAL FACTORS FOR THE SUCCESS OF TRANSLATIONAL RESEARCH PROGRAMS

- Adequate legal framework
- Appropriate institutional organization
- Physical proximity between basic and clinical research
- Translational research groups
- Critical scientific mass
- Cultural/educational change
- Increased research funds
- **Availability of technological platforms**
- Active role of industry with partnership

Biobanks in Medical Research



NCI:	Biological samples are #1 roadblock
OECD:	Global Biological Resource Centre Network
WHO/IARC:	Standards for biological resource centres
ESF:	Science Policy Briefing: Need for integration
EU/ESFRI:	Research infrastructure for Biobanks and Biomolecular Resources (BBMRI)

BIOBANKS & BIOLOGICAL RESOURCE CENTRES

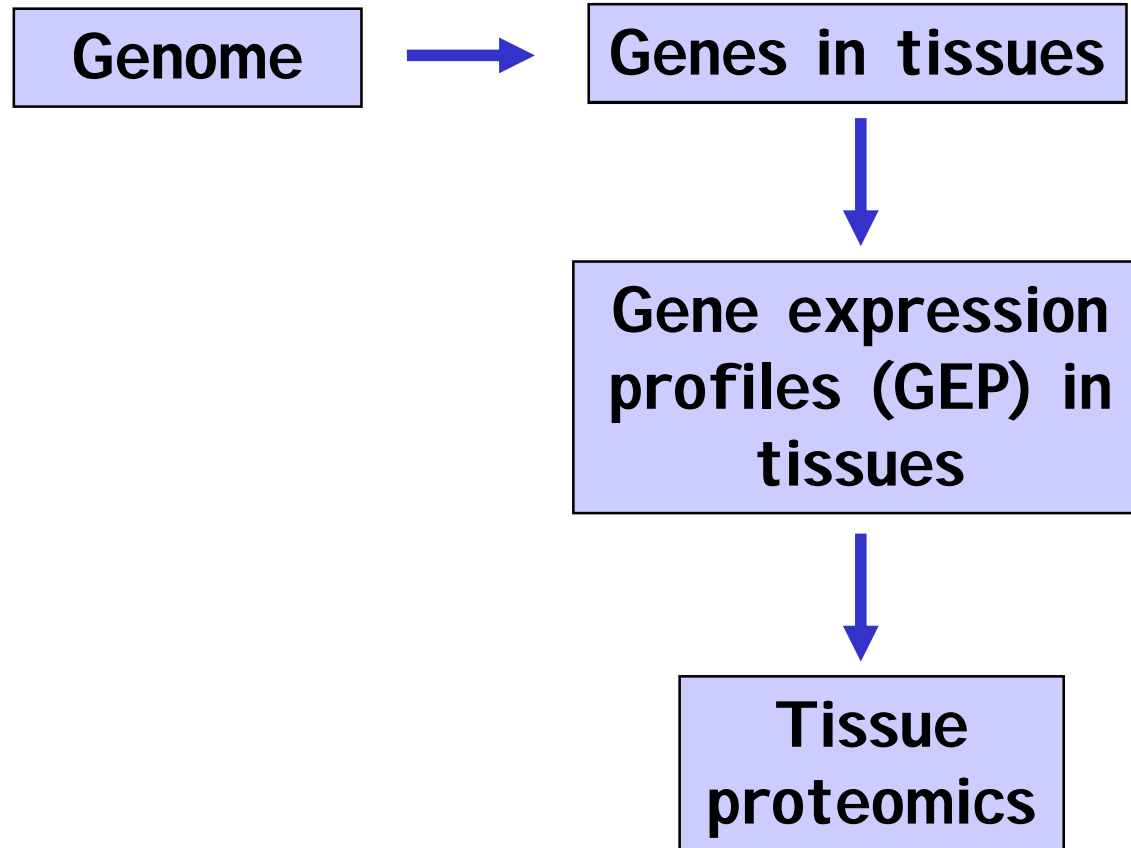
Major role

- To obtain, process and store biological samples and their associated data.
 - To provide DNA samples to research groups.
 - To ensure a rational, effective, ethical and legal use of the available resources.
-

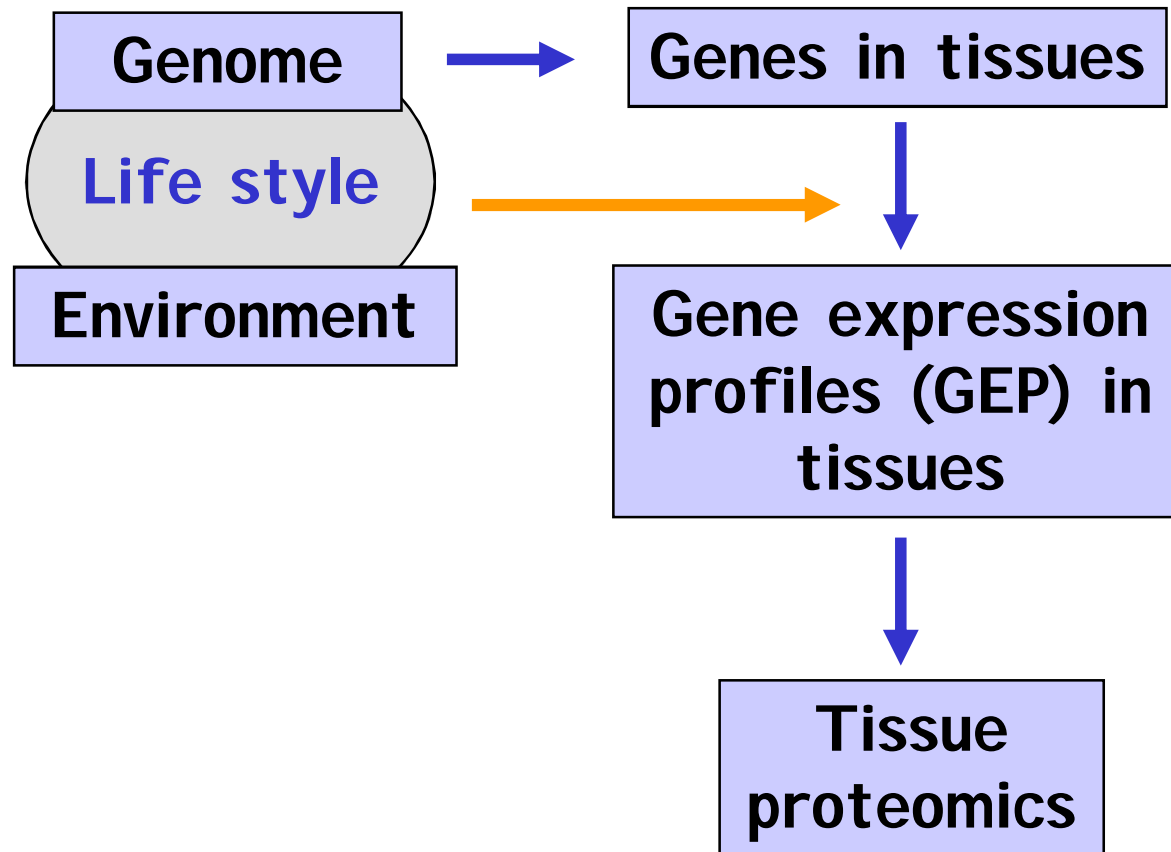
The real value of a biobank lies on the existence of
"cooperative research projects of excellence".

Predict usage of samples far in advance: decide on **type of sample, sample conditions and manipulation** (*sample fractioning, cell & fluid components of interest...*)

"MOVING" BIOMEDICAL RESEARCH TARGETS



"MOVING" BIOMEDICAL RESEARCH TARGETS



Biobank

ASSOCIATED DATA

Epidemiologic questionnaire:

- **General Health**
(familiar antecedents)
- **Nutritional and lifestyle habits**
(smoking, alcohol, physical activity...)
- **Demographic data**
(family, place of living, culture...)
- **Genealogic data**
(two generations)
- **Phenotypic data**
(biochemical analysis, virology,
anthropometrical measurements)

Disease questionnaire:

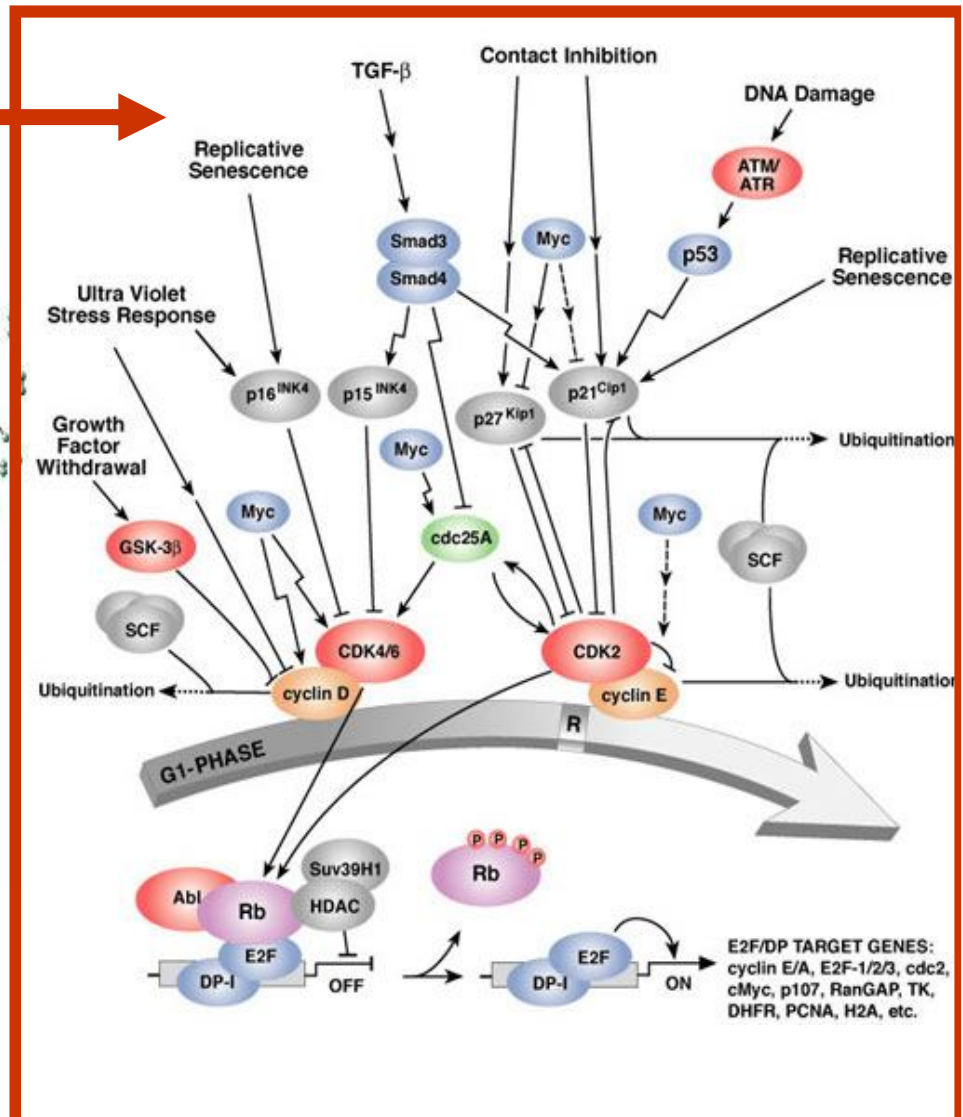
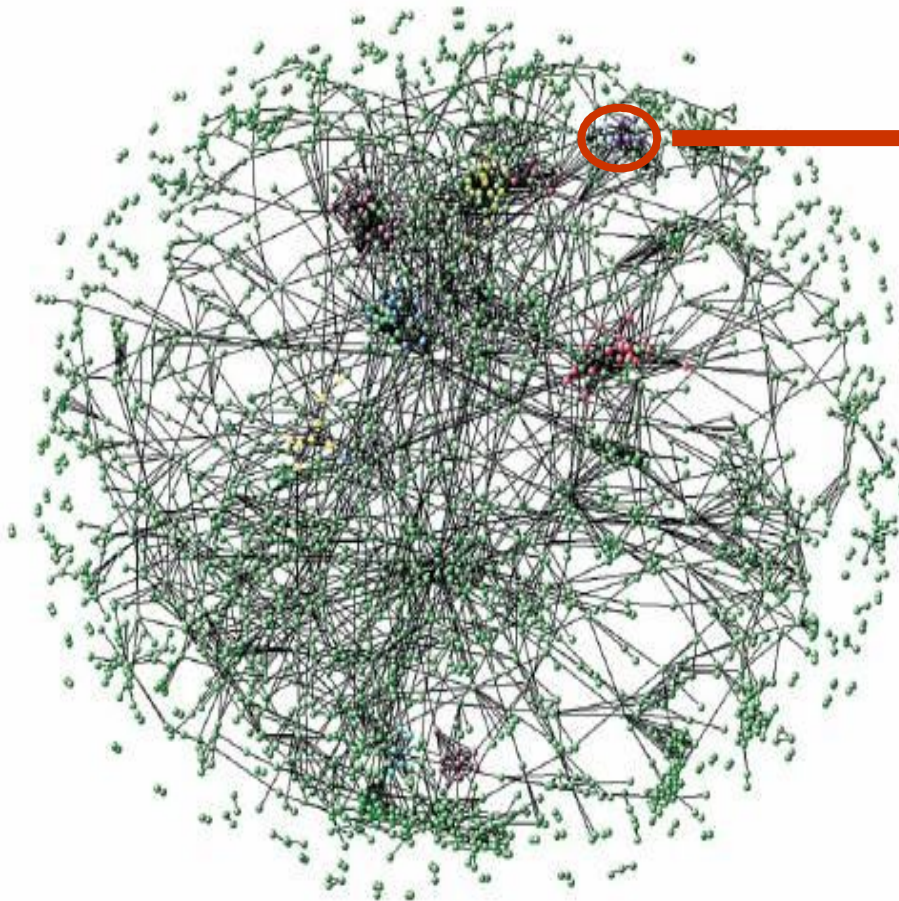
(Specific for each type of disease)

Data always included:

- Clinical data
- Diagnostic data
- Outcome data
- Associated diseases

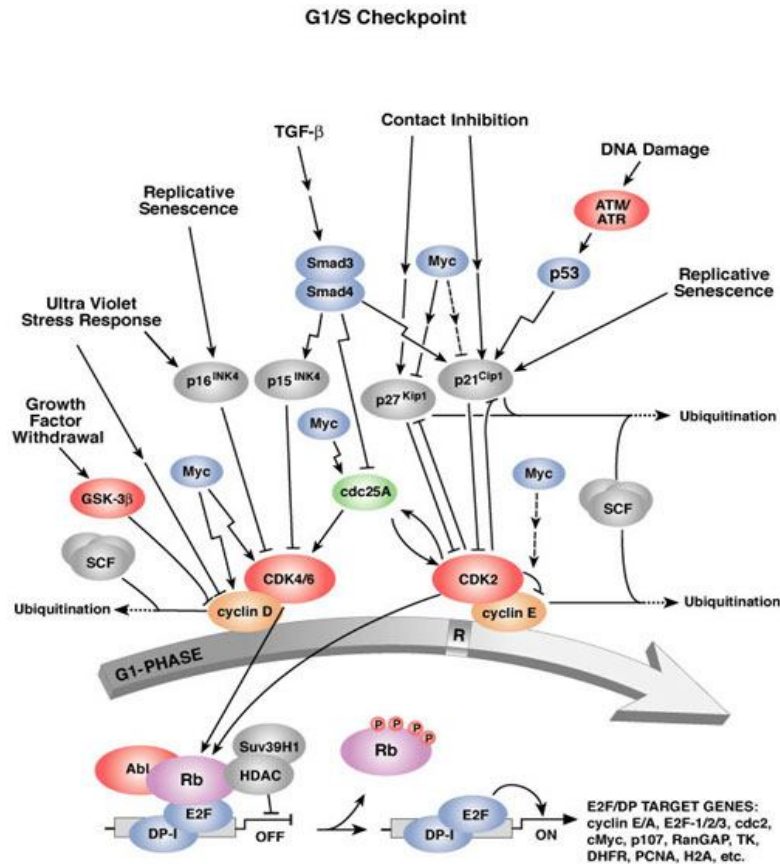
PROTEOMICS: THE WORLD OF PROTEINS

G0/G1 checkpoint



Proteomics 2009

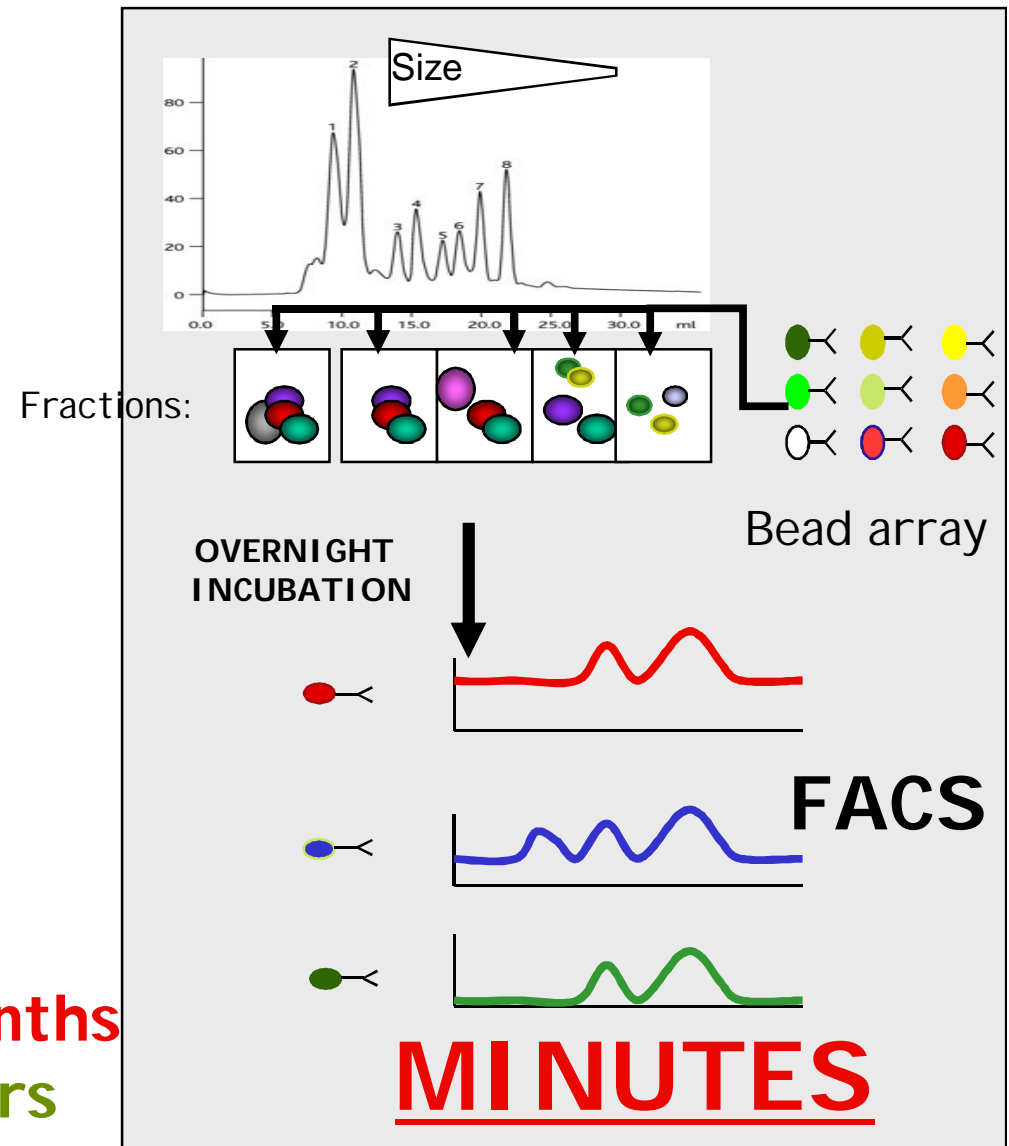
Size exclusion chromatography 0.5-1h



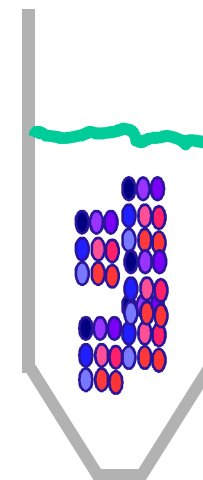
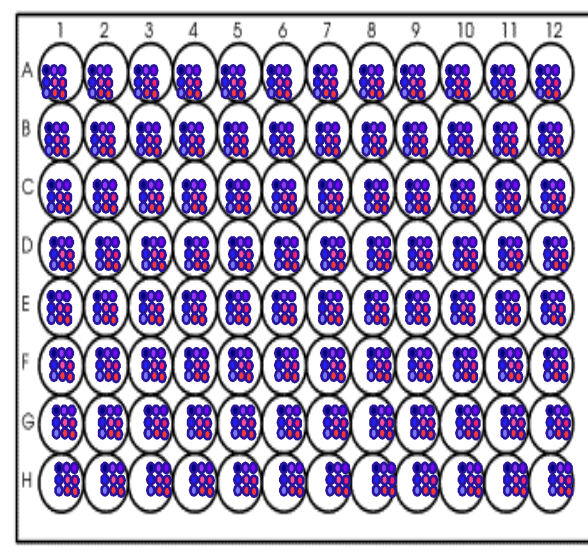
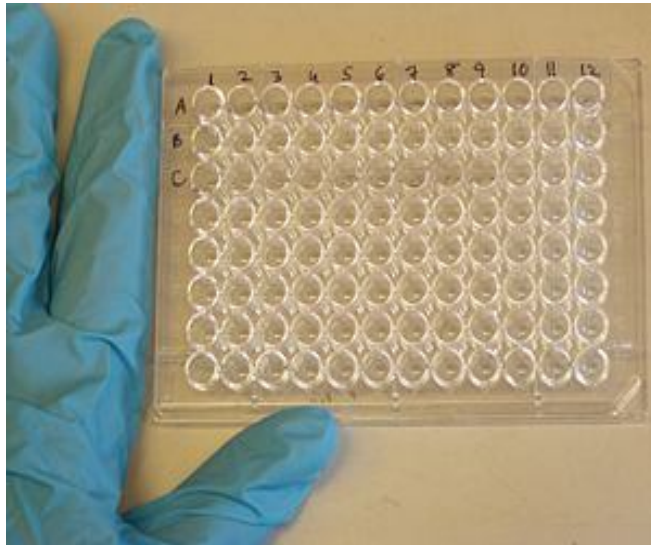
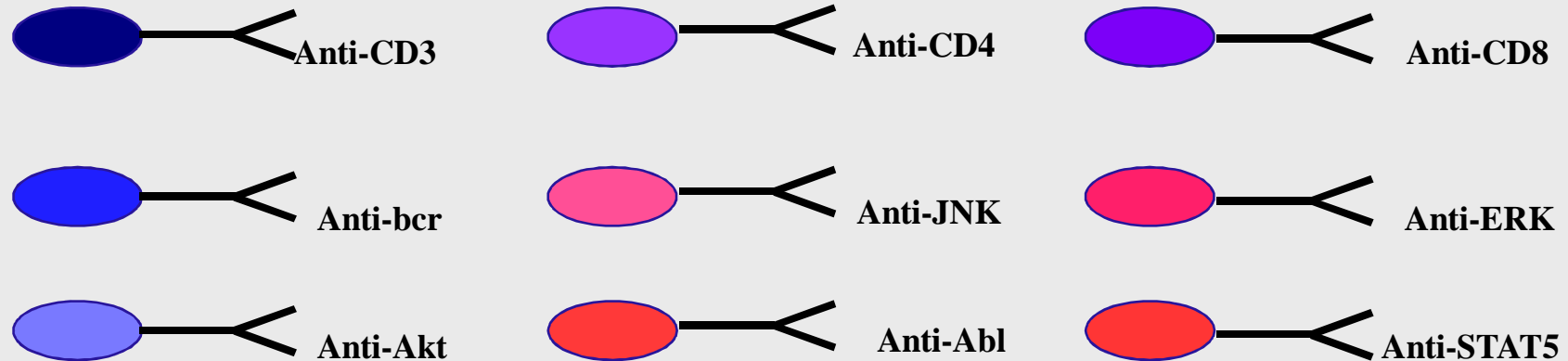
IP+Western blots: **weeks**

IP+ Mass-spectrometry: **months**

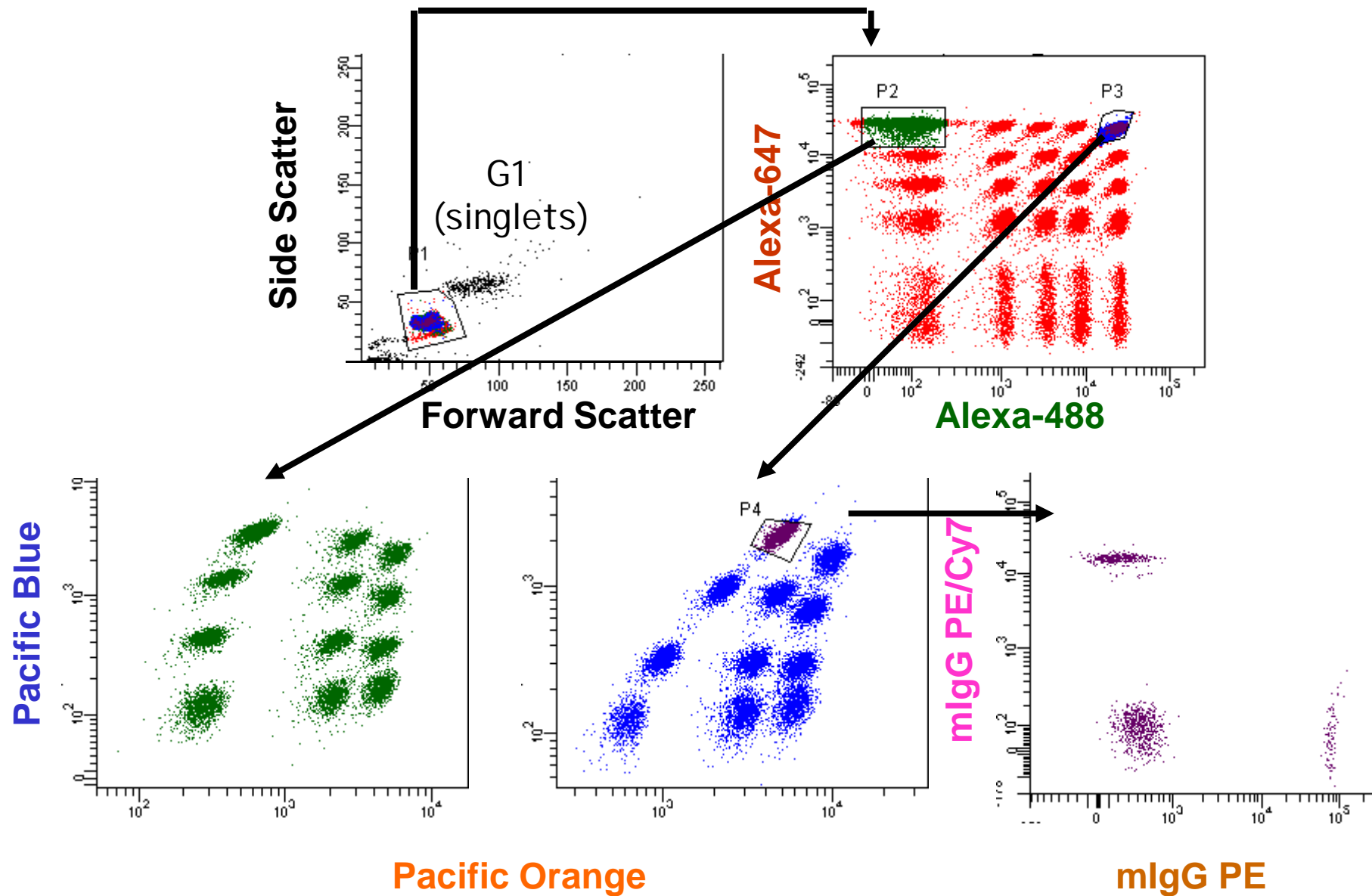
ELISA: **lack of sandwich pairs**



ARRAYS OF BEADS COUPLED TO DIFFERENT ANTIBODIES CAPTURING MOLECULES OF INTEREST

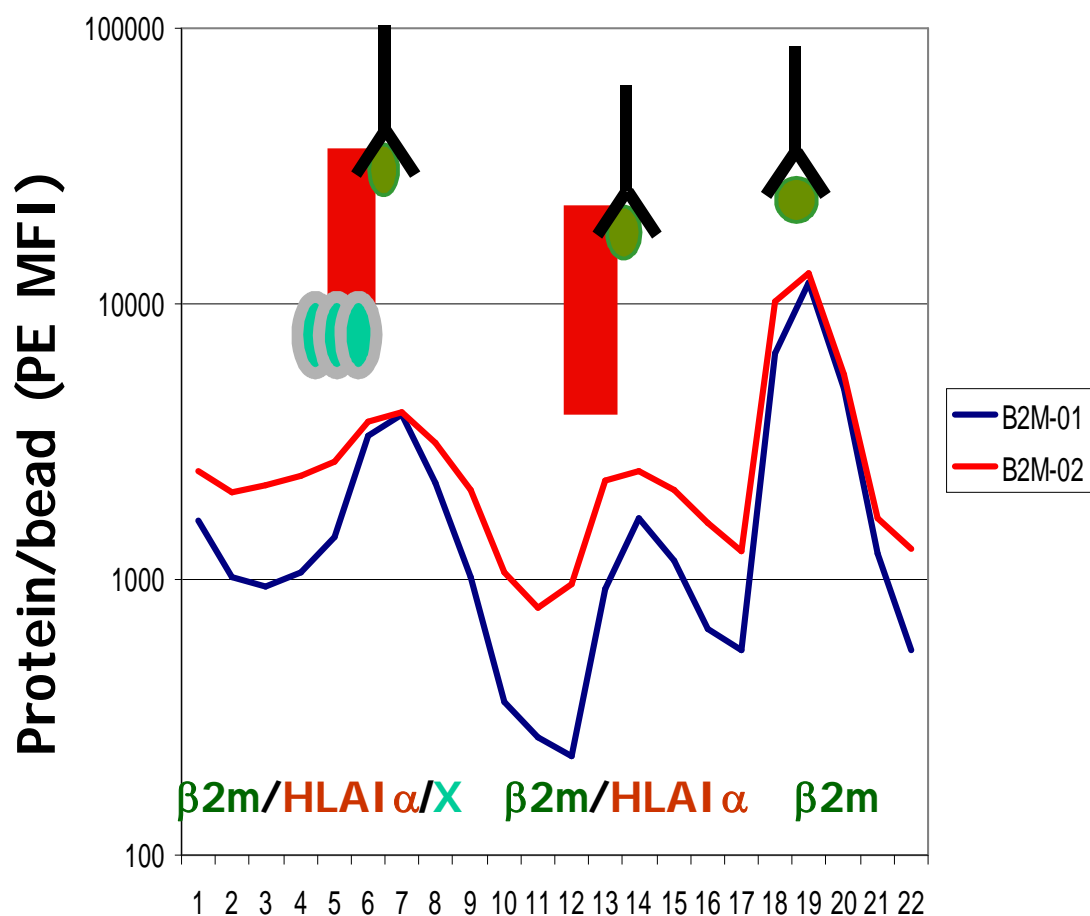


BEAD ARRAY (n=1300 proteins)



Resolution of protein complexes with dual specificity

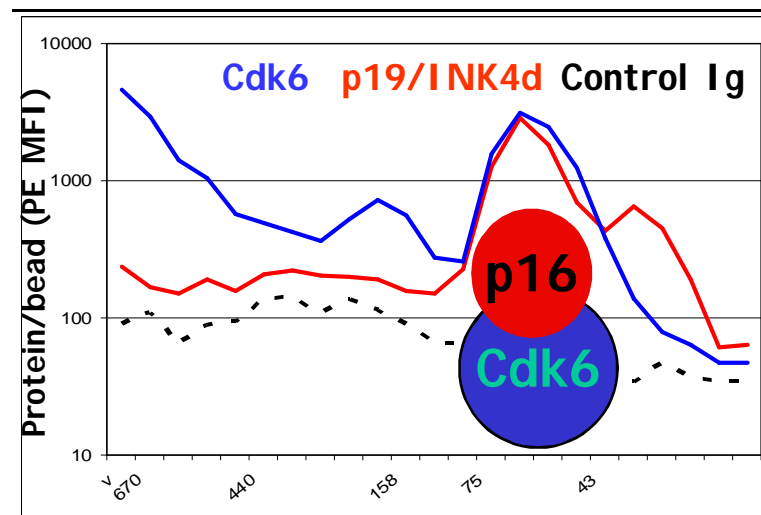
BETA 2 MICROGLOBULIN /MHC CLASS I



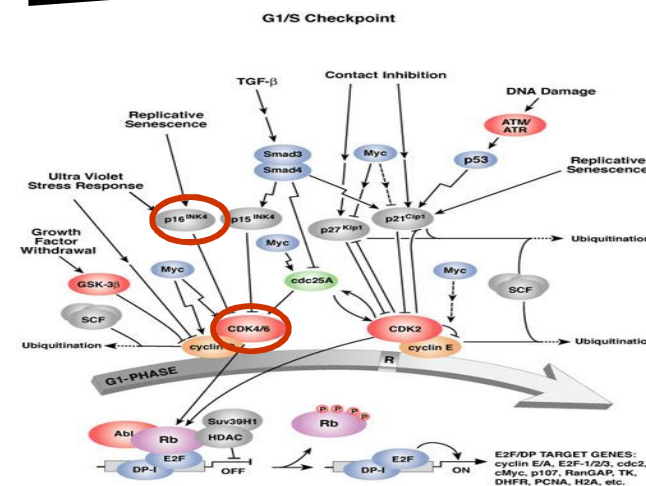
PROTEIN SIZE

Go/G1 Cell cycle checkpoint

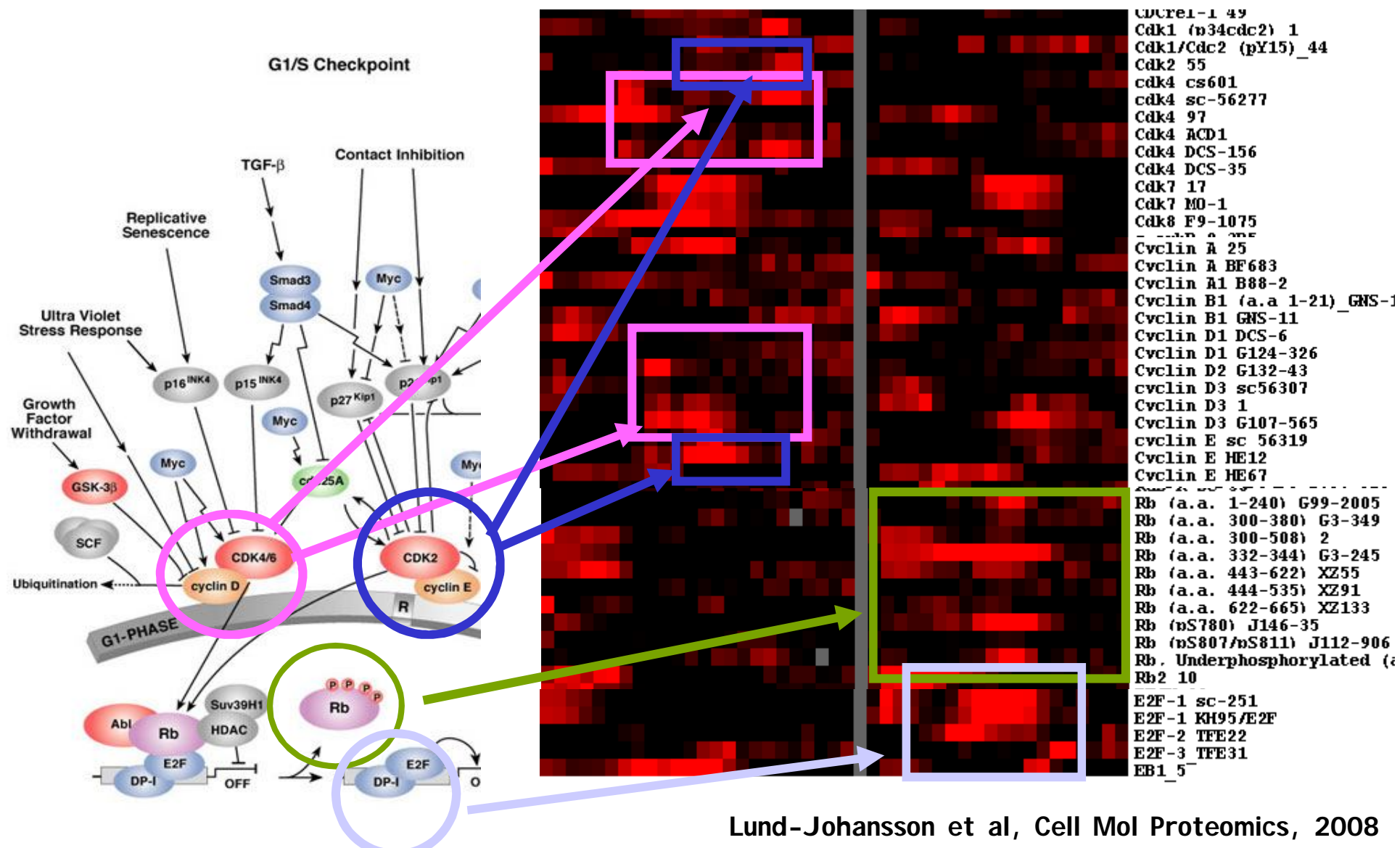
QUIESCENT CELLS



PROTEIN SIZE



Resolution of protein complexes with dual specificity



Complexity of multiplexing protein measurements

- Presence of **specific proteases** (i.e. decreased or undetected protein levels)

Cocktail of protease inhibitors (i.e. small molecules)

- **Protein localization**: membrane, cytoplasmic and nuclear (i.e. membrane or DNA binding with difficult access for Abs).

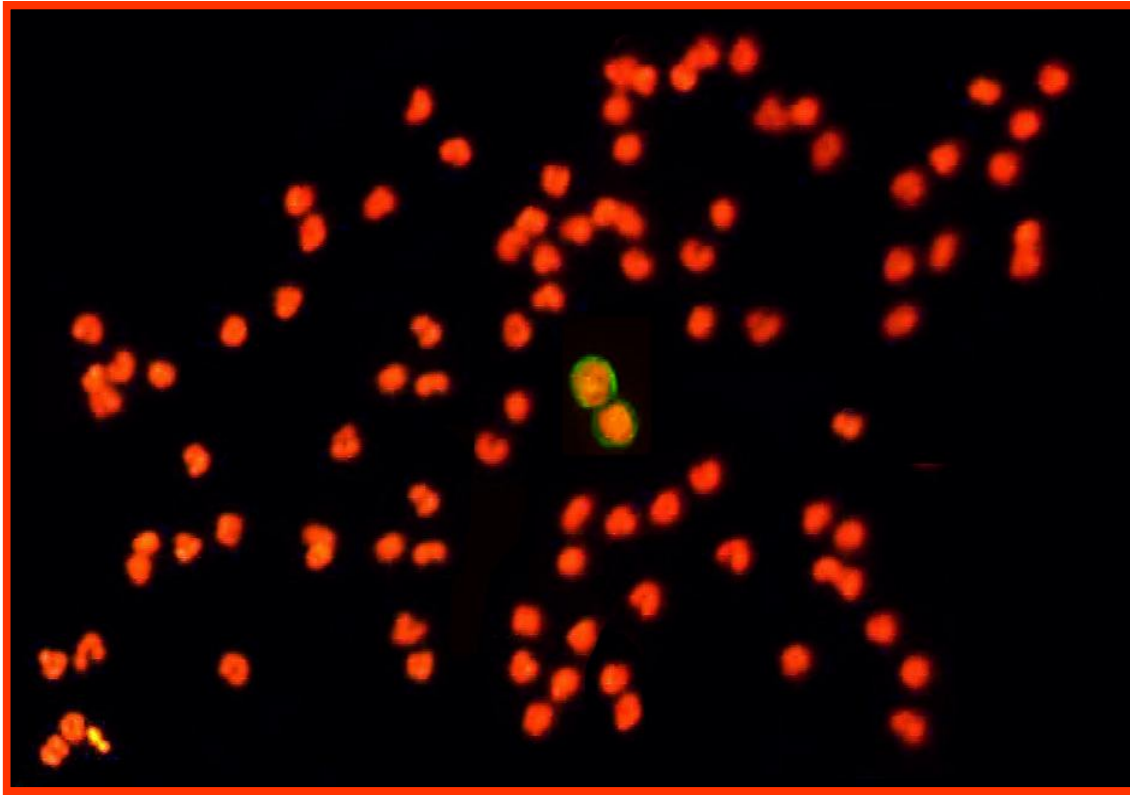
DNA digestion

- **Protein status** (i.e. phosphorylated vs non-phosphorylated monomers vs multimeres and protein complexes with varying access to antibodies)

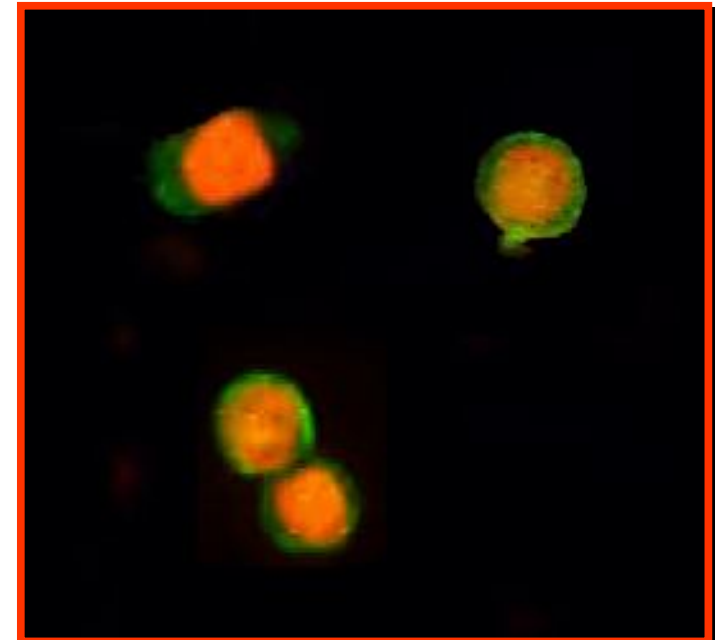
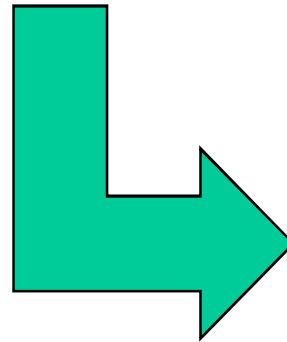
Inhibition of phosphatases

One condition per tube for detection of all proteins

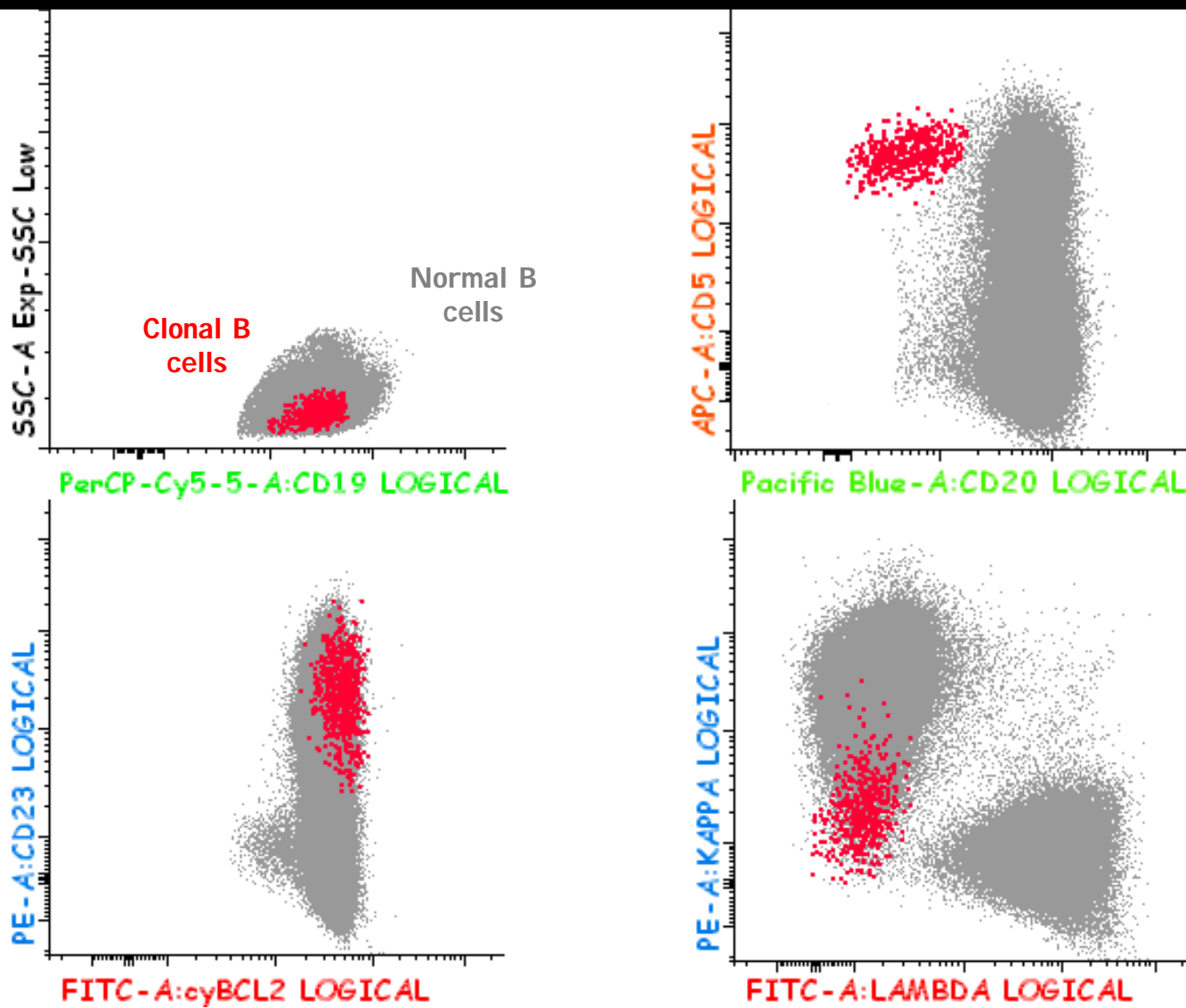
STORAGE OF PB SAMPLES FROM BREAST CANCER



Purify cells of
interest*



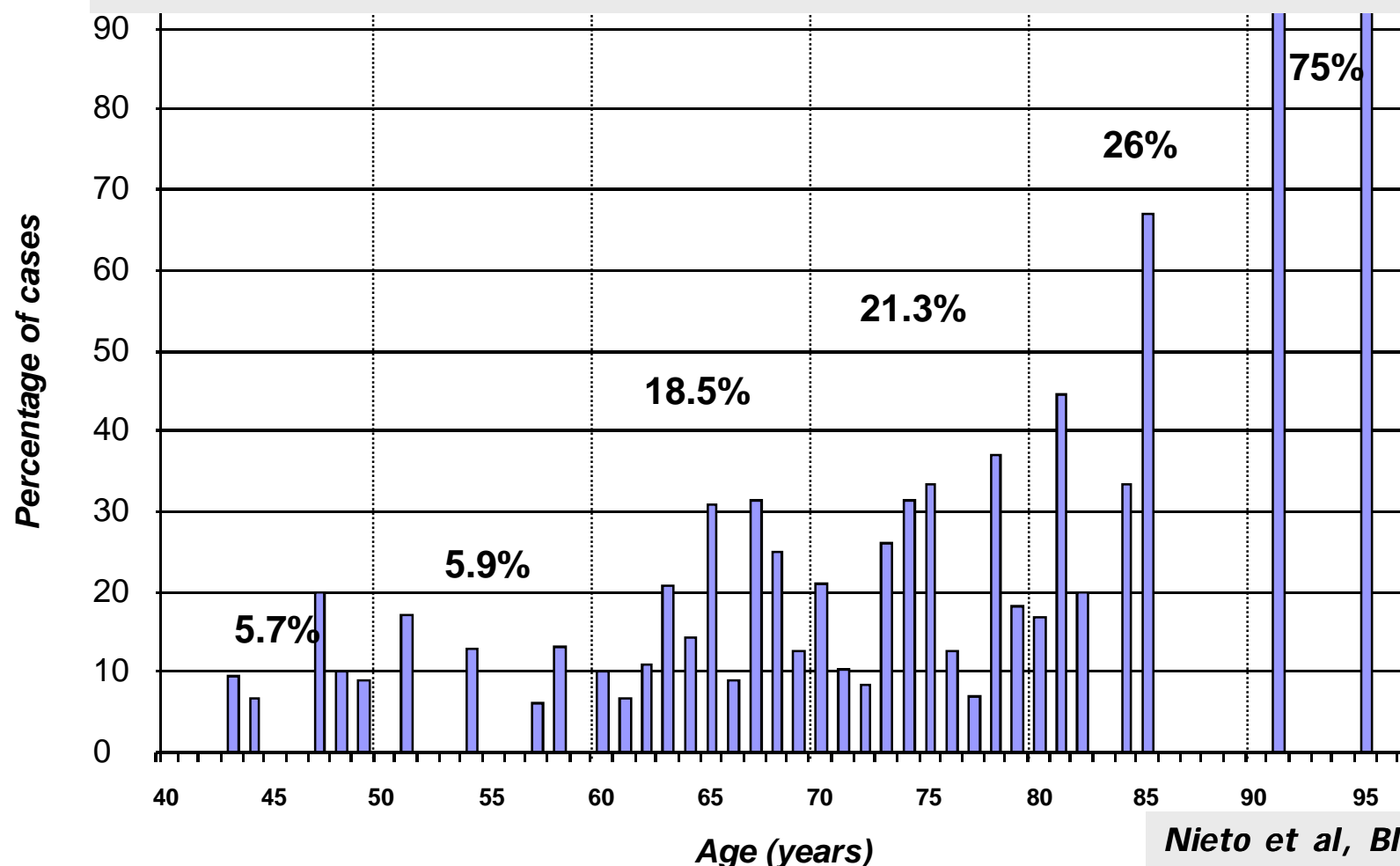
*Abs against cell surface structural/non-functional proteins



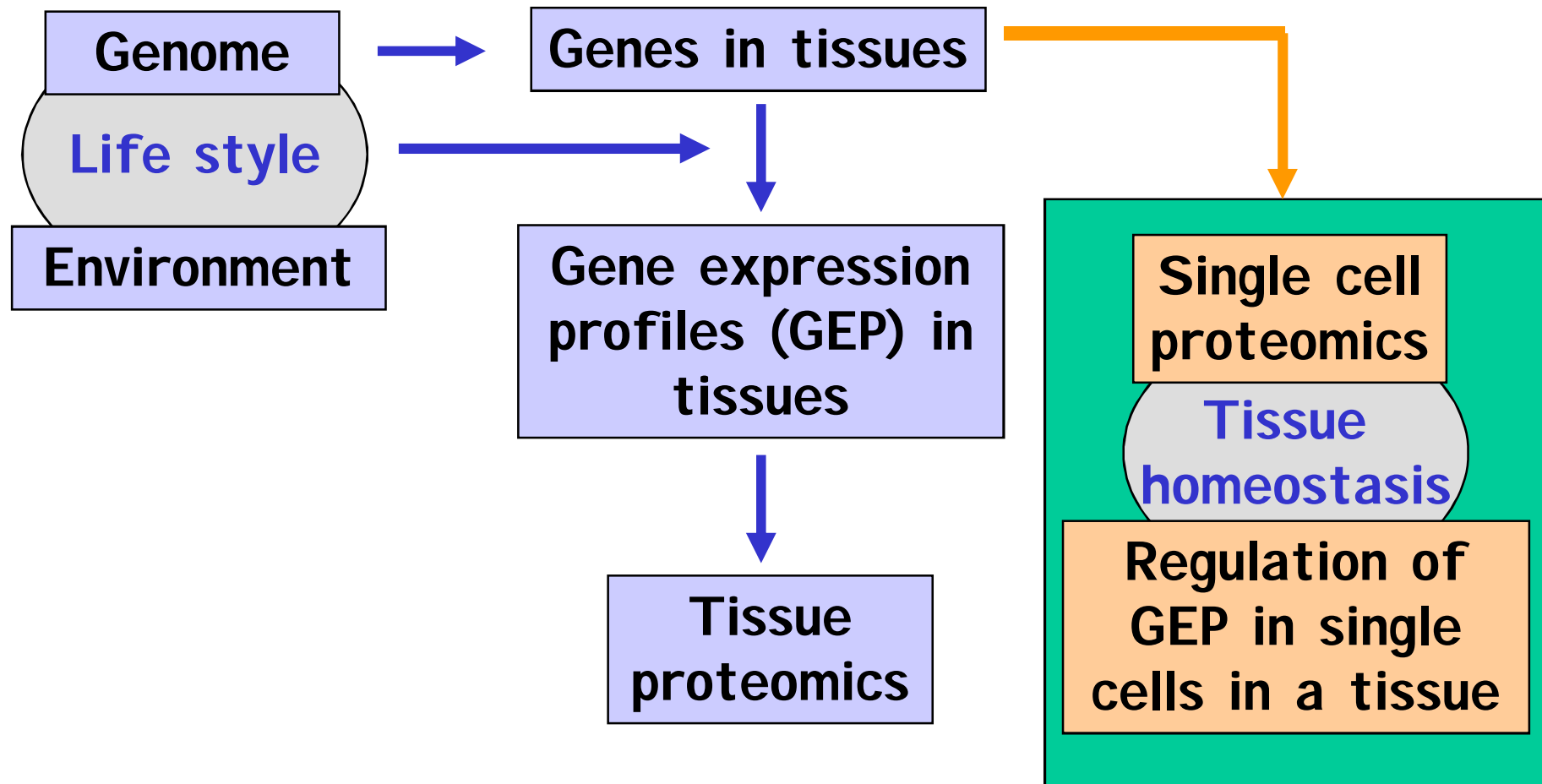
*0.35% of all B-cells & 0.03% of all leucocytes

Frequency of PB CLL-like B-cell clones in healthy adults according to age

Found in 94/637 cases (14.8%)

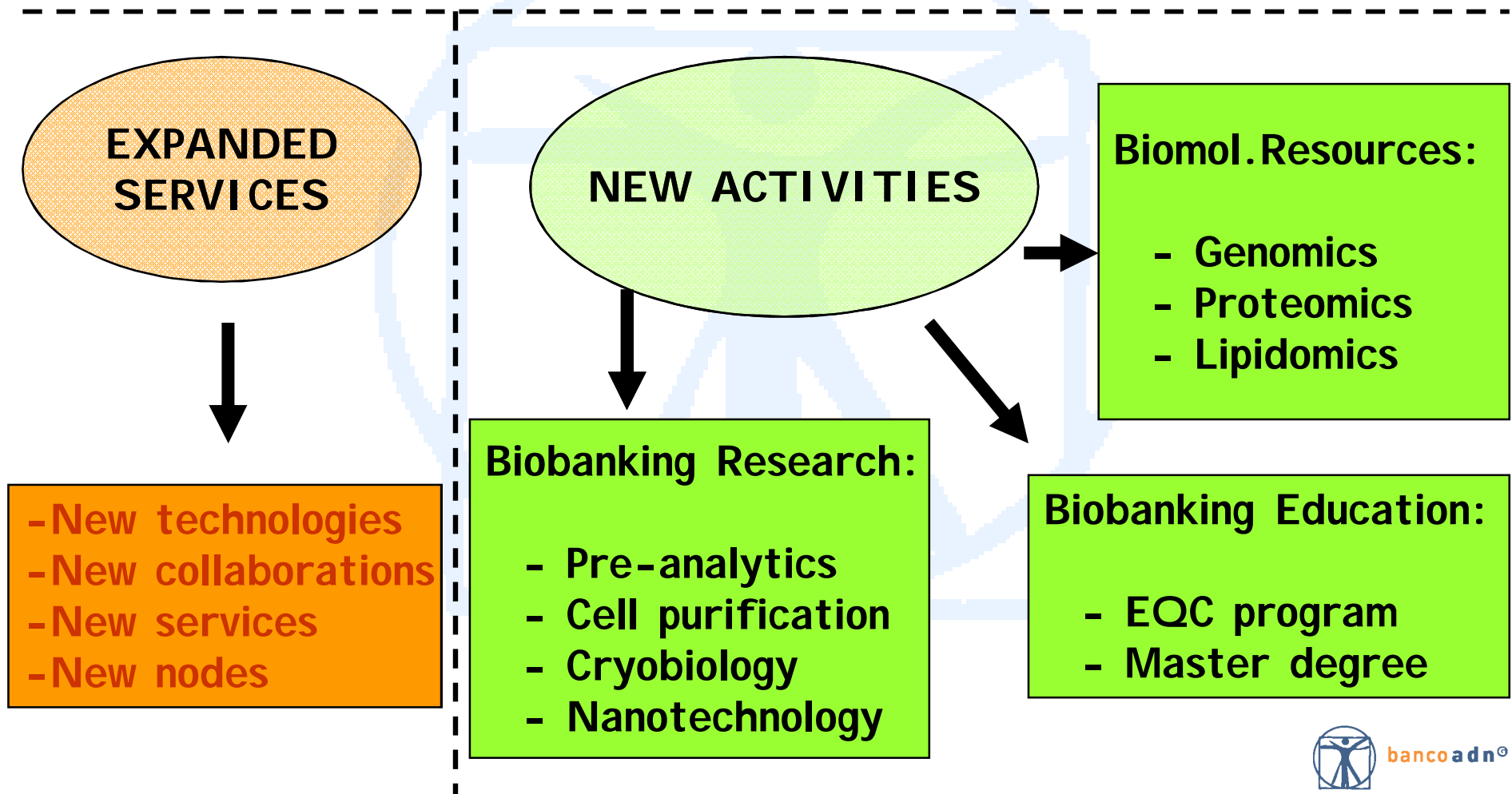


"MOVING" BIOMEDICAL RESEARCH TARGETS



FROM BIOBANKS TO BIOLOGICAL RESOURCE CENTRES

ADDITIONAL TASKS



CENTRO DE CARACTERIZACIÓN DE RECURSOS BIOLÓGICOS

INCORPORACIÓN DE INVESTIGACIÓN EN PROCEDIMIENTOS Y TECNOLOGÍAS DE ÚLTIMA GENERACIÓN

CENTRO DE CARACTERIZACIÓN DE RECURSOS BIOLÓGICOS
PLANTA BAJA

FASE PRE-ANALÍTICA

FRACCIONAMIENTO Y PURIFICACIÓN CELULAR

OBTENCIÓN DE LÍNEAS CELULARES

NANOTECNOLOGÍA MOLECULAR

CRIOBIOLOGÍA

BANCO NACIONAL DE ADN

ZONAS COMUNES

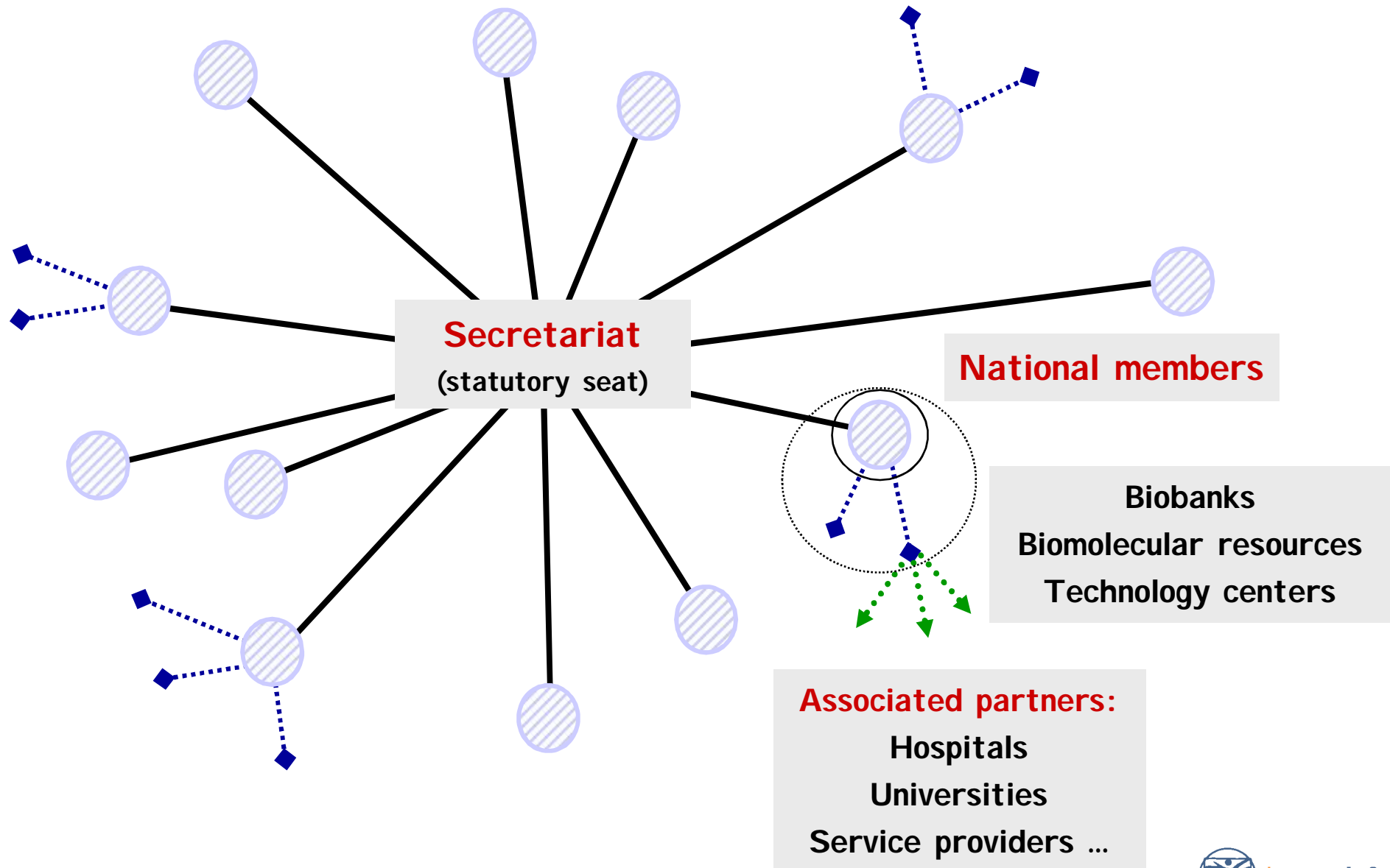
	SUPERFICIE UTIL
LABORATORIO-2	50.00m ²
LABORATORIO-3	50.00m ²
LABORATORIO-4	80.00m ²
DESPACHO	14.00m ²
UNIDAD DE COORDINACIÓN TÉCNICA	18.00m ²
SALA DE REUNIONES	30.00m ²
UD DE ADMINISTRACIÓN	25.00m ²
SALA LIMPIA	20.00m ²
ALMACEN DE FUNGIBLES	20.00m ²
RECEPCIÓN DE MUESTRAS	20.00m ²
TOTAL	777.00m ²

	SUPERFICIE UTIL
LABORATORIO-1	80.00m ²
LABORATORIO-2	50.00m ²
LABORATORIO-3	50.00m ²
LABORATORIO-4	50.00m ²
LABORATORIO-5	50.00m ²
LABORATORIO-6	50.00m ²
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LABORATORIO-9	50.00m ²
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LABORATORIO-71	50.00m ²
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LABORATORIO-79	50.00m ²
LABORATORIO-80	50.00m ²
LABORATORIO-81	50.00m ²
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LABORATORIO-83	50.00m ²
LABORATORIO-84	50.00m ²
LABORATORIO-85	50.00m ²
LABORATORIO-86	50.00m ²
LABORATORIO-87	50.00m ²
LABORATORIO-88	50.00m ²
LABORATORIO-89	50.00m ²
LABORATORIO-90	50.00m ²
LABORATORIO-91	50.00m ²
LABORATORIO-92	50.00m ²
LABORATORIO-93	50.00m ²
LABORATORIO-94	50.00m ²
LABORATORIO-95	50.00m ²
LABORATORIO-96	50.00m ²
LABORATORIO-97	50.00m ²
LABORATORIO-98	50.00m ²
LABORATORIO-99	50.00m ²
LABORATORIO-100	50.00m ²

	SUPERFICIE UTIL
DESPACHO DIRECCION	14.00m ²
SECRETARIA DIRECCION	14.00m ²
AREA DE GESTION	40.00m ²
GESTION ADMINISTRATIVA	40.00m ²
CENTRO DE DIFUSION	106.00m ²
ASEOS	654.00m ²

SUPERFICIE TOTAL CONSTRUIDA DE PROYECTO..7639.32m²

BBMRI : A EUROPEAN HUB STRUCTURE





MUCHAS GRACIAS

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