



Leipziger Forschungszentrum für
Zivilisationserkrankungen

UNIVERSITÄT LEIPZIG

Medizinische Fakultät

Liquid-biobanking in:

- 1.) **Epidemiological studies (prevalence, incidence)**
- 2.) **disease-oriented biobanks (case-control studies, cohort studies)**
- 3.) **biobanks for clinical studies**
- 4.) **biobanks in laboratory medicine**



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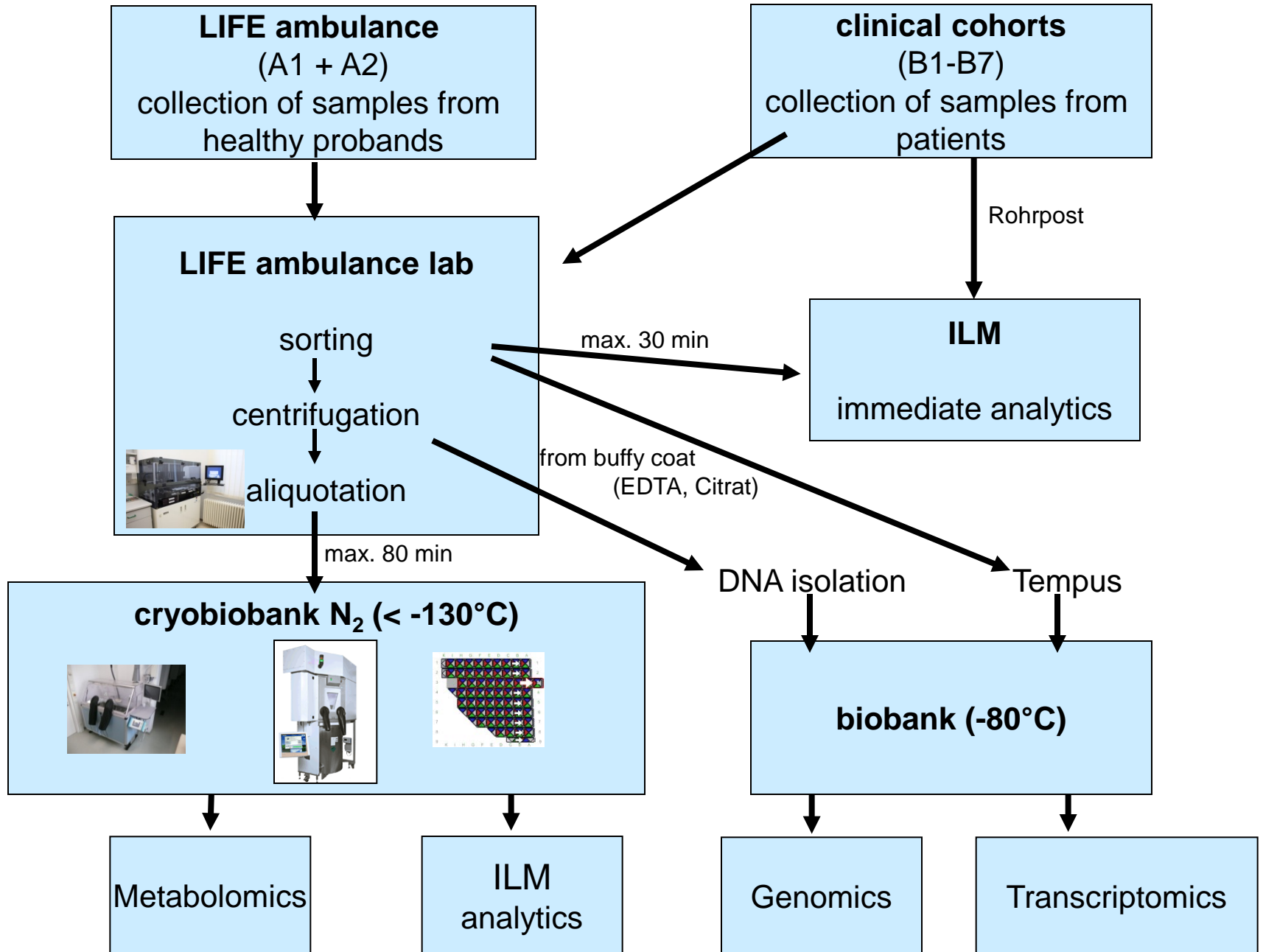
**High sample quality
and standardisation of samples
is important for the
development of new innovative
diagnostics!**



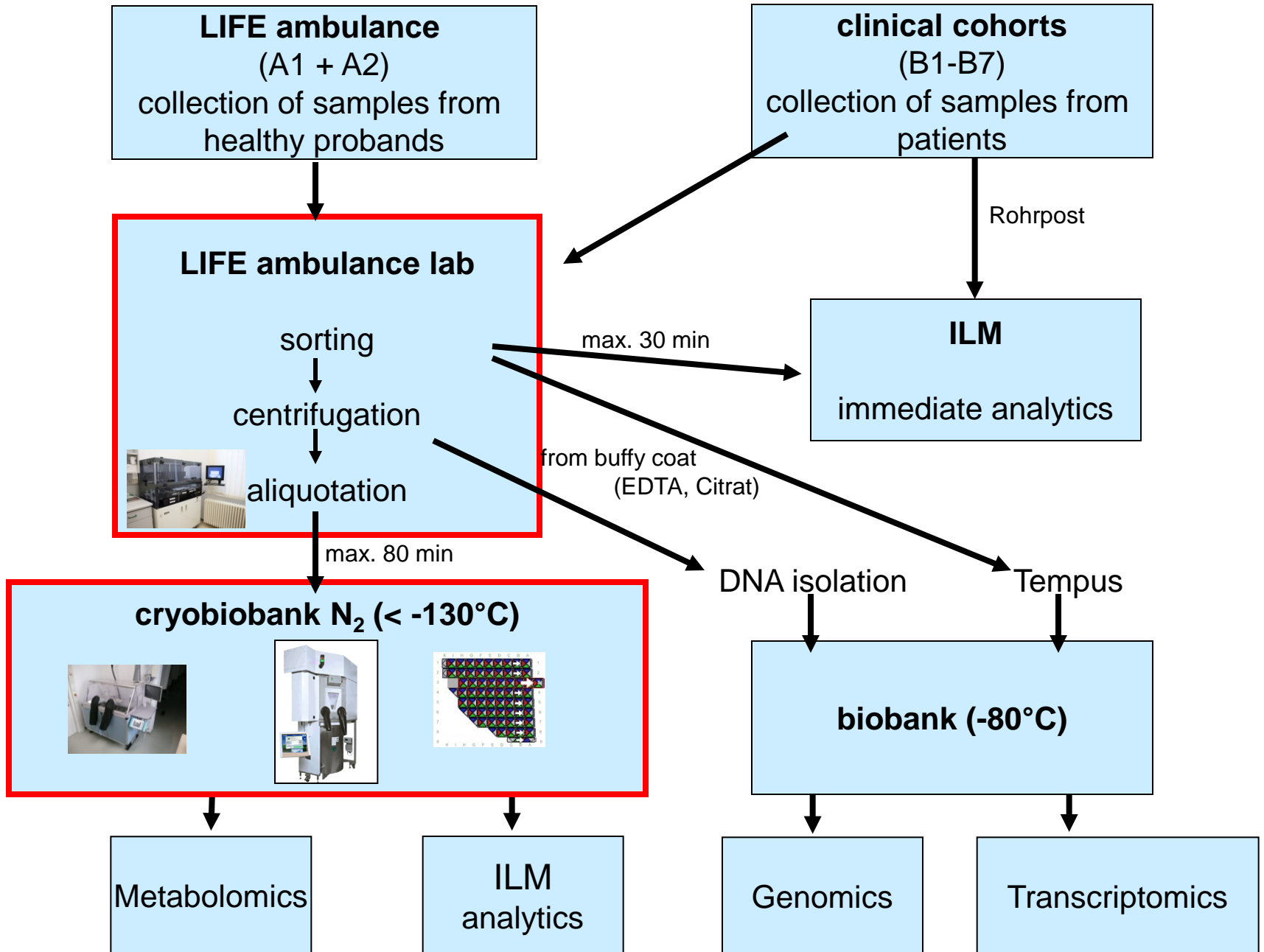
Factors influencing biomarker quality

Phase	Factors	activities
Blood collection	Sample material Volume (esp. citrate)	SOPs
Sample transport	Temperature Duration Delivery System	SOPs
Sample preparation	Centrifugation speed Duration Temperature	SOPs, Automatisation
Storage	Temperature Duration Freeze-Thaw-Cycles	SOPs, Automatisation, 'sample handling at low temperatures, high number of aliquots

General sample workflow



General sample workflow

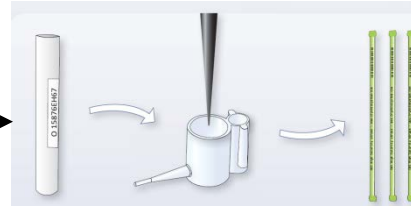




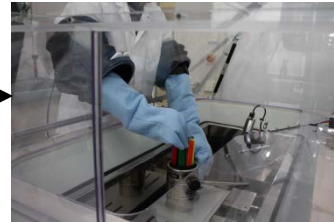
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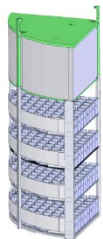
aliquoting



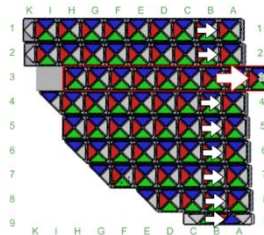
transport and sorting



storage



1
2
3
4





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LIFE Biobank

Automated sample filling in barcode labelled straws



DIVA, Cryobiosystems Paris



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Cryotubes



Straws



	racks / cryotubes	goblets / straws
per level	8 / 768	255 / 4.590
per rack	64 / 6.144	1020 / 18.360
per tank	256 / 24.576	4080 / 73.440



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	- 80 C°	< - 130 °C
serum	x	x
EDTA-plasma		x
Citrate-plasma		x
Lithium-Heparin-plasma		x
urine	x	
dry blood cards	x	
DNA	x	
peripheral mononuclear cells (PBMCs)		x
stabilized whole blood	x	



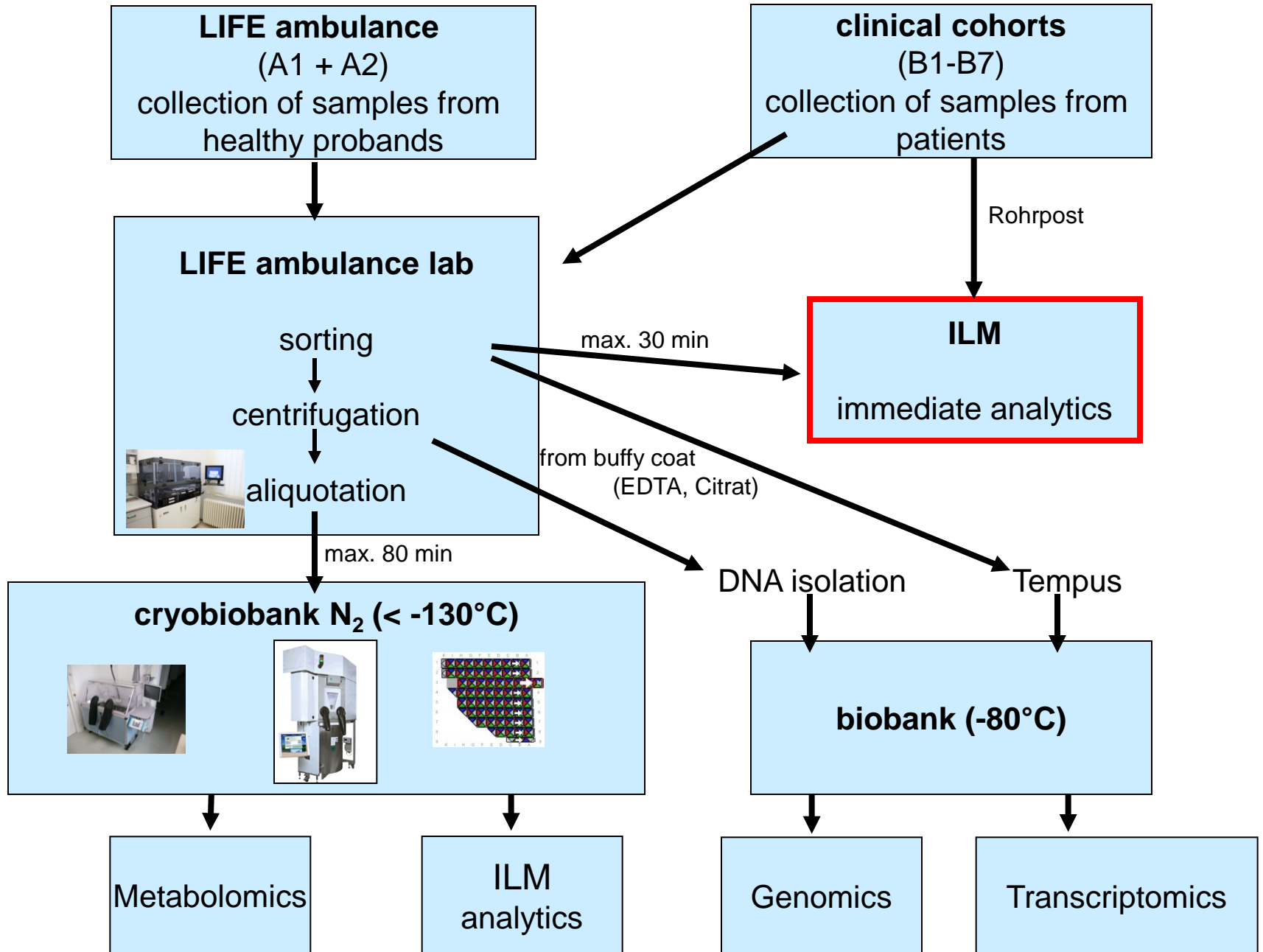


LIFE Biobank – sample material

Cohort	Actual count	Serum	Plasma	Urine	Whole blood (incl. Stab.)	PBMCs	DNA
Adults (40 – 80 y)	3376	24	15	5	5	2	3
Children (0 – 18 y)	2093	2-11	2-7	5	2	1	2
Parents	1085	9	9	5	1	1	2
Mothers	456	13	13	5	1	1	2
Cardiovascular	5399	16	12	0	4	2	3
Head-neck-cancer	635	7	8	3	1	0	2
Obese children	329	15	4	5	2	1	2

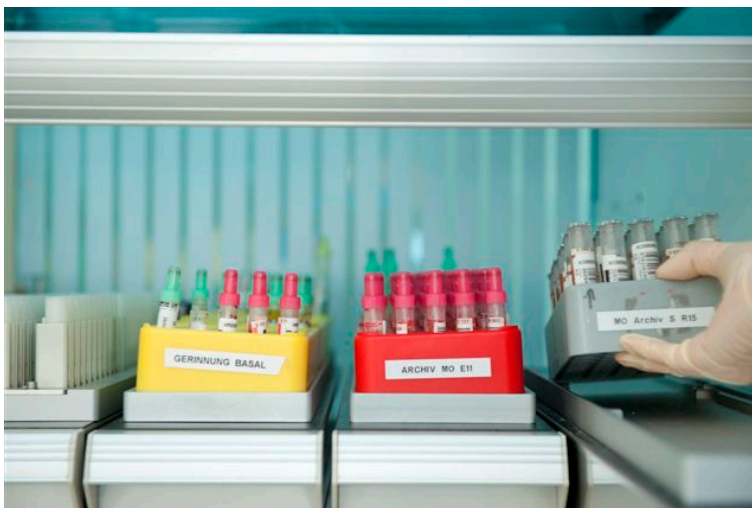
**also collecting colostrum (mothers), hair (children+parents+mothers),
dry blood cards (all)**

General sample workflow





ILM immediate analytics



Electrolytes

Liver-pancreas-screening

Kidney-diagnostic

Cardial-diagnostic

Lipids

Glucose metabolism

Vitamines

Bone metabolism

Iron metabolism

Thyroid diagnostics

Inflammation

...



First biobanking output

- **exom analysis of 780 children for association with different phenotypes in cooperation with WTCCC**
- **genome wide association study for the regulation of plasma plant sterol concentrations**
- **genome wide association study and eQTL analysis of 3.000 participants of the cardiovascular disease cohort for determination of risk factors of coronary artery disease**
- **genome wide association study of the adult cohort addressing multiple phenotypes (starting end of december)**
- ...



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Future plans

Complete automatization of the LIFE cryobiobank

