

SCAPIS

Swedish CardioPulmonary bioImage study

En världsunik forskningsstudie som ska förhindra hjärt-lungsjukdom.

En unik kunskapsbank för framtiden!

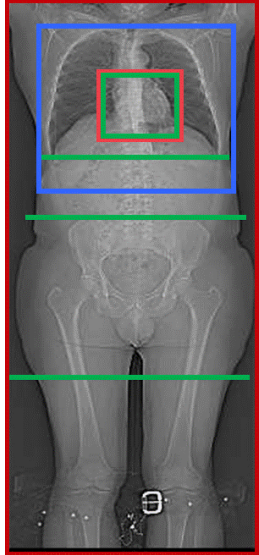
Göran Bergström
Wallenberglaboratoriet
Göteborgs Universitet



Swedish Heart 
Lung Foundation

Main funder of SCAPIS

SCAPIS outline



Identification of vulnerable plaques

- ✓ CTA
- ✓ Ultrasound (carotid artery)
- ✓ MRI (carotid artery)

Visceral adipose tissue, epicardial and liver fat

- ✓ CT

Structural changes in lung tissue

- ✓ CT

Baseline survey includes:

- ✓ Blood tests
- ✓ Anthropometry
- ✓ Blood pressure, ankle-arm index
- ✓ Activity measurement (Actigraph)
- ✓ Lung function tests (spirometry, CO-diff)
- ✓ ECG
- ✓ Detailed questionnaire - Environmental and socioeconomic factors, diet

Local and central biobank for blood and urine analyses

Follow-up via national registries

- ✓ Morbidity
- ✓ Mortality



30,154 men and women, 50 to 64 years

Population, randomly recruited

Six universities, 5000 /site

www.scapis.org

Bergström et al. The Swedish CardioPulmonary BiImage Study: objectives and design. J Intern Med 2015.

SCAPIS optionals and substudies

Microbiota, n=15.000 (Göteborg, Malmö, Uppsala)

Fitness, n=6.000 (Göteborg)

Echocardiography n=6.700 (Linköping, Malmö)

24-hour blood pressure, n=4.000 (Malmö, Linköping, Uppsala)

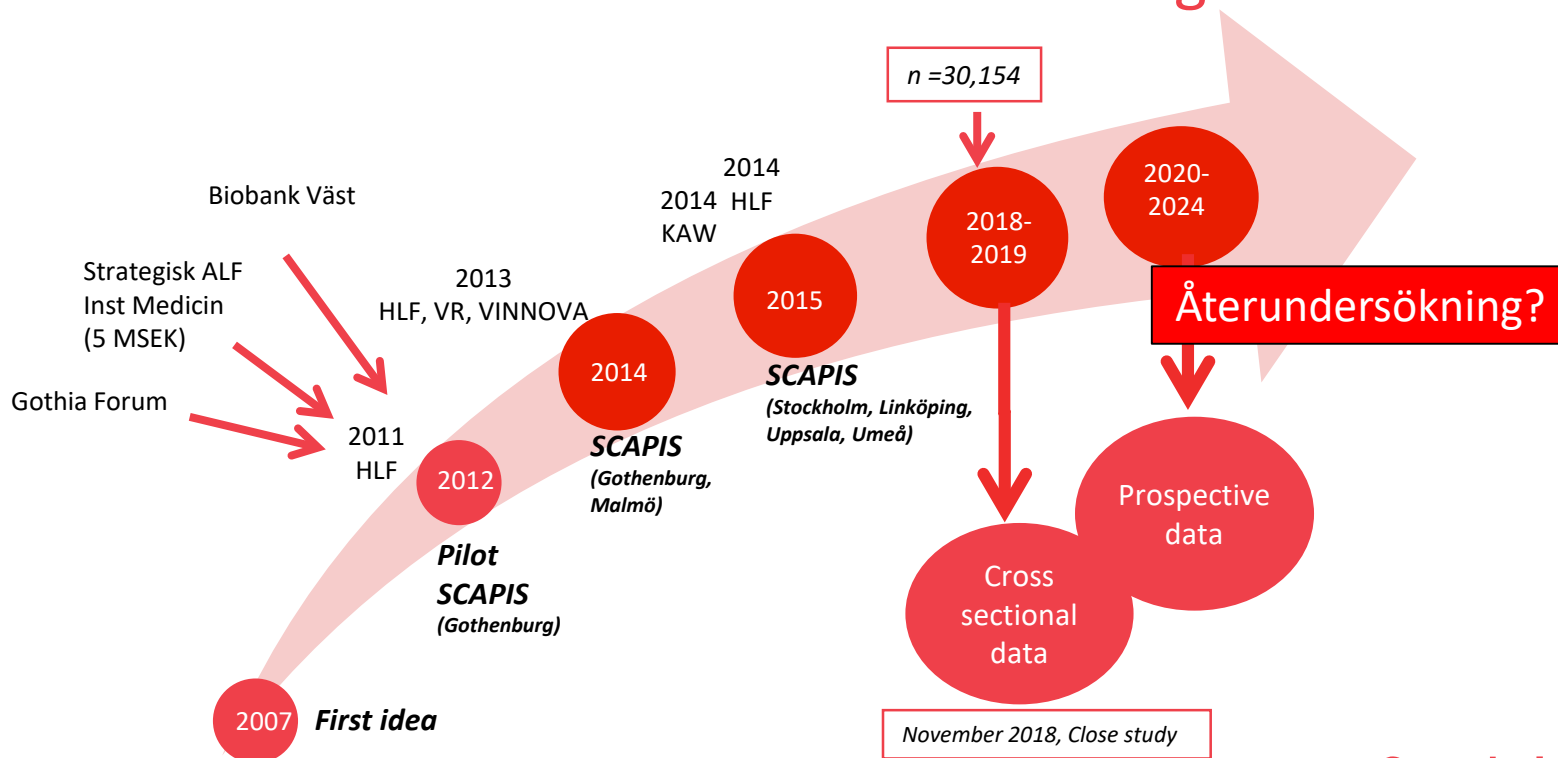
PWV, n=11,000 (Malmö, Linköping)

Sleep apnea, n=10.000 (Uppsala, Göteborg, Umeå)

Cognitive test, n=11.000 (Göteborg, Uppsala)

OGTT, n=5.000 (Göteborg, Umeå)

SCAPIS – time line - financing



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SCAPIS 2012



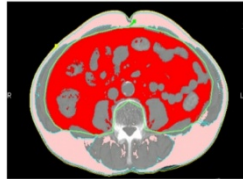
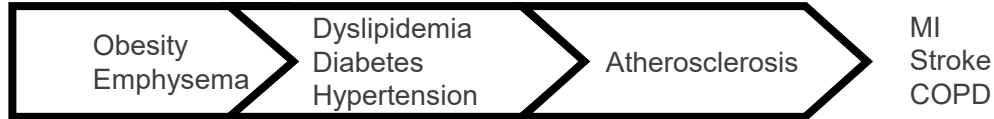
The Local Gothenburg Steering group: Åsa Särllvik (communication), Camilla Palmqvist (coordinator), Kaj Stenlöf (Head of Gothia Forum), Annika Rosengren (Cardiology), Göran Bergström (PI, Imaging), Bo Lundbäck (Pulmonary medicine), John Brandberg (Radiology), Margareta Sandberg (HR).

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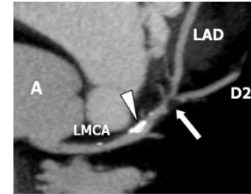
Imaging in cardiopulmonary disease development



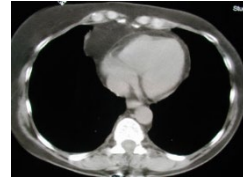
Visceral obesity (CT)



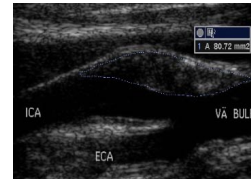
Liver steatosis (CT)



Coronary atherosclerosis (CTA)



Pericardial fat

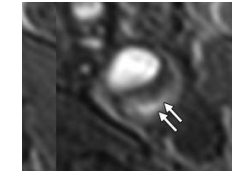


Carotid atherosclerosis (US)

↓ Carotid plaques
>2,5 mm (6-7%)



Emphysema



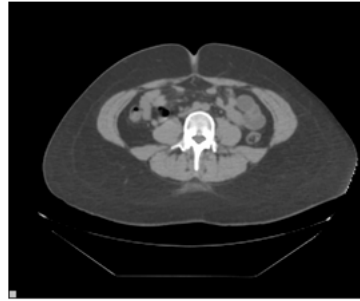
Carotid plaque morphology
(MRI), n=3.000)

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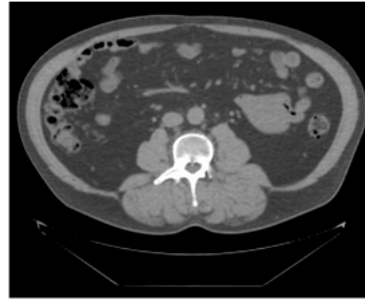
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Imaging for deeper phenotyping



BMI 33



BMI 33

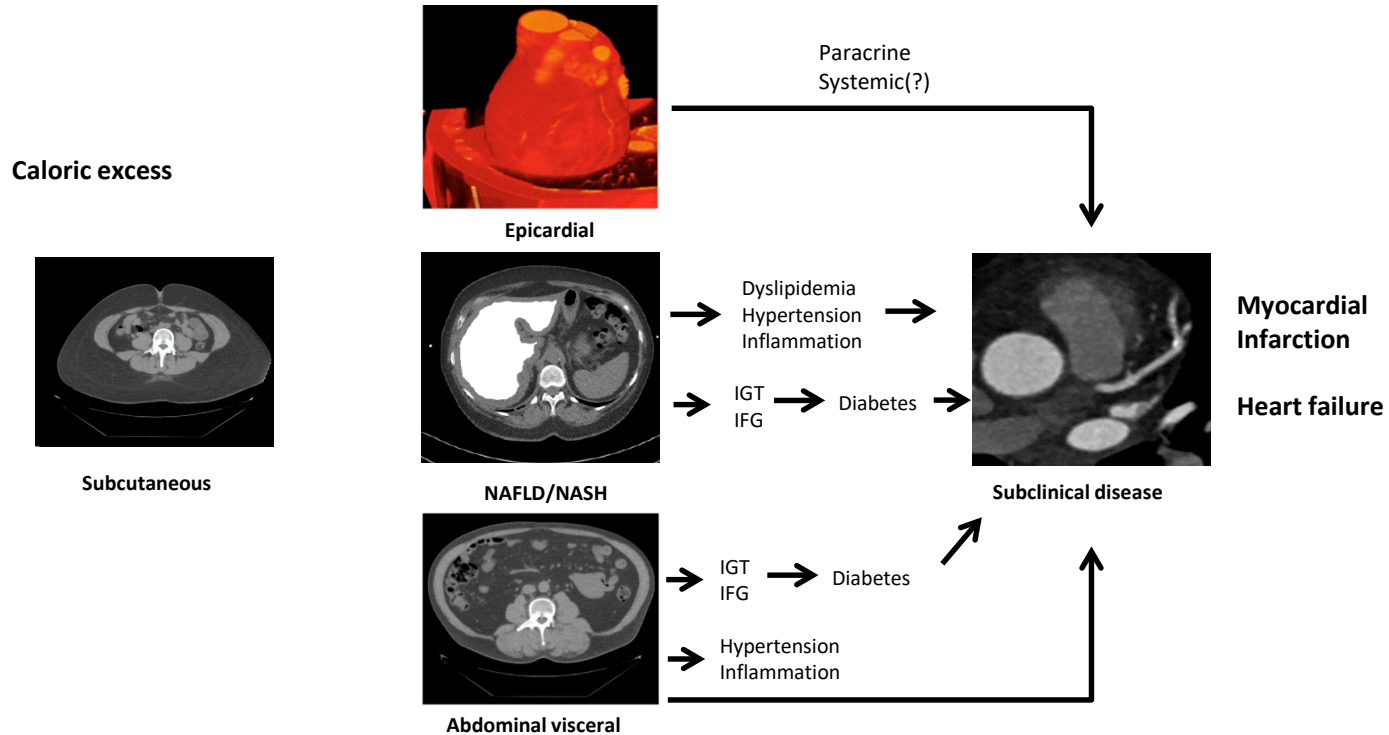


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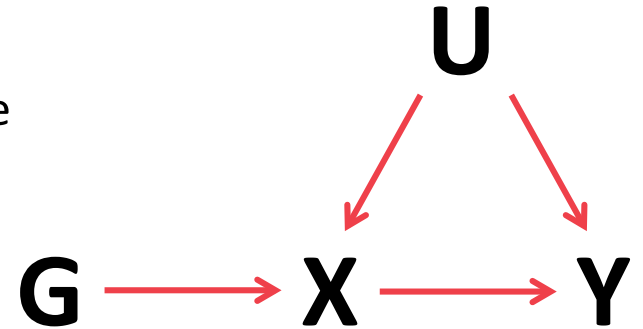
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Ectopic fat accumulation and cardiovascular disease



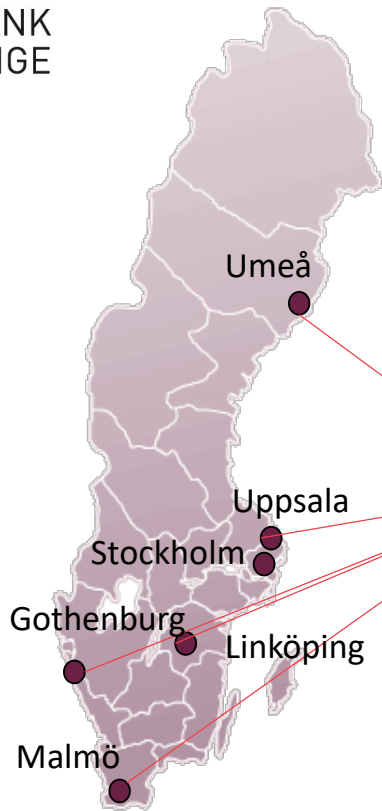
Mendelian Randomization Study

- To explore causality we will apply Mendelian Randomization
- **Mendelian Randomization** is instrumental variable analysis using genotypes as instruments
- The instrument (G) is associated with the exposure (X)
- If we know $G \rightarrow X$ and $G \rightarrow Y$; we can calculate causal effect of $X \rightarrow Y$



SCAPIS sample collection and biobanking

A diversity of sample types
for a wide range of downstream applications



Low pre-analytical variability
2 h from needle to freeze
Quality cohort

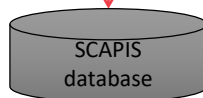
Samples for immediate analysis:

- Glucose & HbA1c
- Hemoglobin
- Cholesterol
- Triglycerides
- HDL, LDL
- Creatinine
- hsCRP

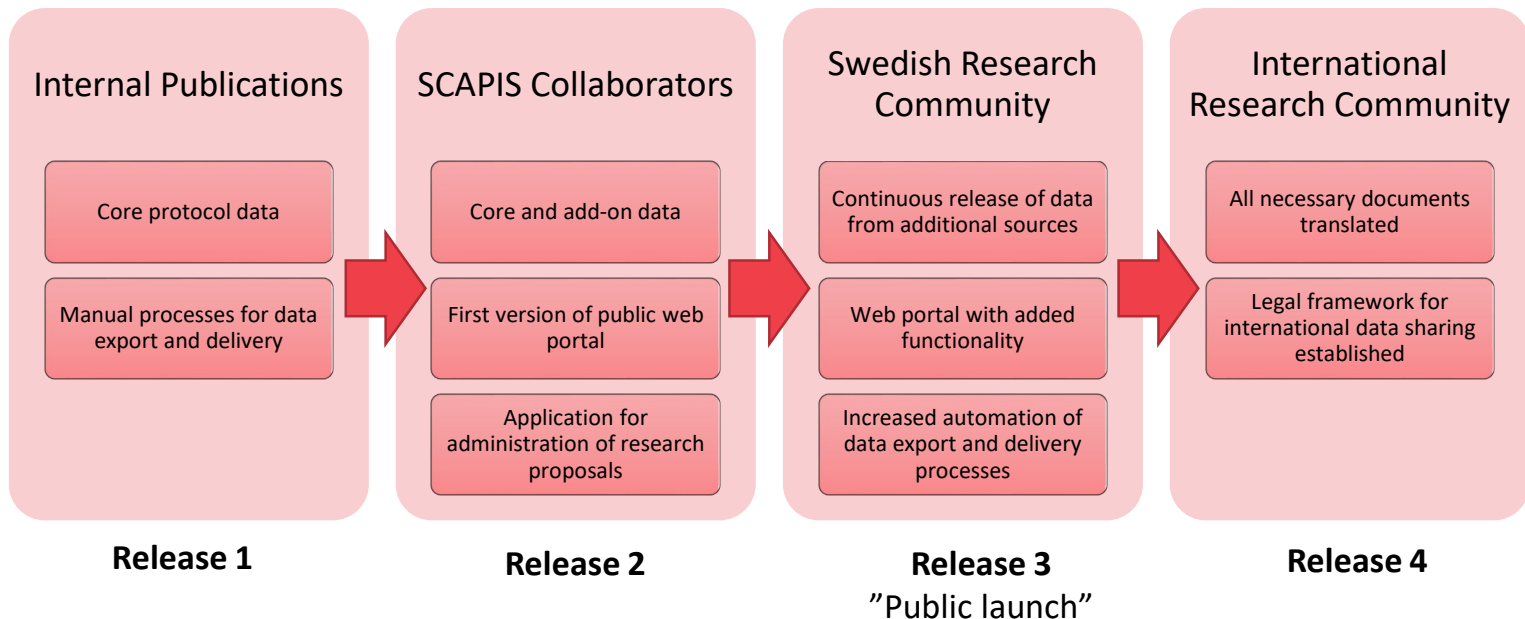
A centralized or federated biobank with:

- DNA (1 tube)
- EDTA plasma (16 x 220 µl)
- Li-Heparin plasma (16 x 220 µl)
- Citrate plasma (8 x 220 µl)
- Urine (16 x 220 µl)

- 1 700 000 aliquotes



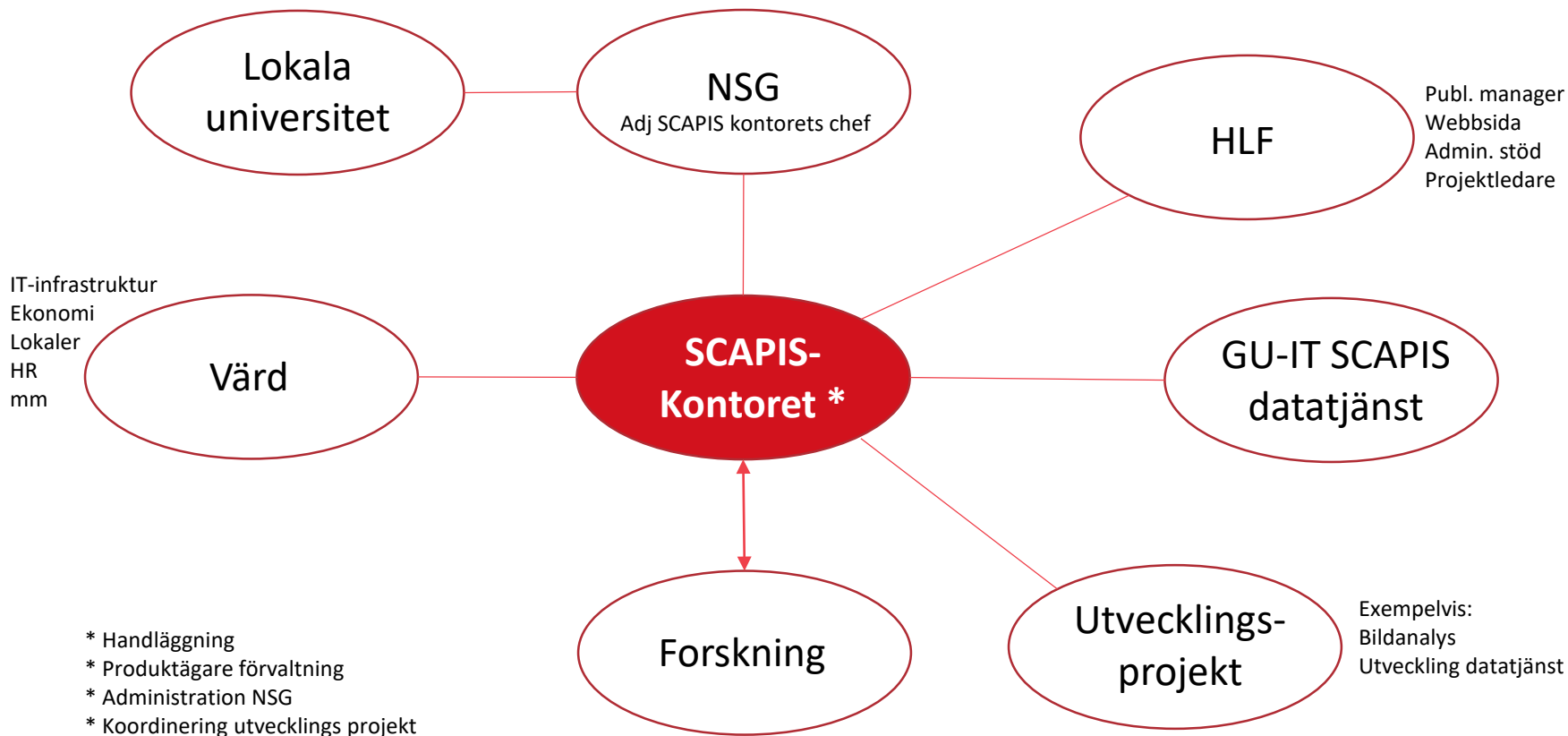
Gradual release and implementation of SCAPIS Data Services



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Framgångsfaktorer för ett växande SCAPIS...

Effektiv och fri datadelning till behöriga forskare

Genotypning

Effektiv, nyskapande registerforskning

Framgångsrik bildanalys

Blodburna markörer som måste mätas (Insulin, AST/ALT, Alfa-1-antitrypsin, NTproBNP,)

Återundersökning

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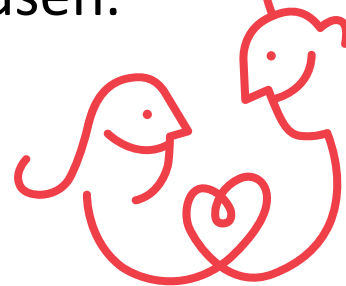
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TACK

Till Hjärt-Lungfondens alla givare, Knut och Alice Wallenbergs Stiftelse, Vetenskapsrådet, Vinnova, universitet och universitetssjukhusen.

Det är ni som gör det möjligt.



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