Importance of Preliminary Data for a Successful S10 Application

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Potential Preliminary Data – Why?

- Preliminary data are not required, though if feasible, can be included **to justify the technical choice of the instrument**.
- Explain why the chosen model and its manufacturer are the most suitable for your user group.

- Preliminary data are not required, but if available, they may be used **to illustrate the benefit of the requested instrument to the research projects**.
- If access to a demo instrument is practical **preliminary data are encouraged**.

Potential Preliminary Data – Why 2?

- To demonstrate that the new proposed S10 instrument can **achieve scientific data / results that are not obtainable with currently available instrumentation at your institute**.

  - **Note**: Provide an inventory of similar instruments existing at your institution, neighboring research institutions, or otherwise accessible; describe why each similar instrument is unavailable or inappropriate for the proposed research. --- <u>this is to demonstrate why you really need this instrument</u>

Potential Preliminary Data – Why 3?

- Demonstrate that the proposed S10 instrument actually would practically work for the projects of your users
- You can get data from proposed major / minor users in the context of their experimental paradigms / tissues / or cell-types

  (this is not always a given)

- Turning a theoretical idea into **a feasible scientific opportunity**
- Show exciting scientific data that are making a strong point why **this S10 instrument will be perfect for your user group**

Potential Preliminary Data – How?

- How can you get preliminary data if you don't yet have the instrument you are proposing the S10 grant for ?

- Contact **instrument vendor for demo data**
  - Preferably **arrange early** as many core directors and scientists who will like to write a S10 grant will ask vendors for demo data
  - Know early what instrument you like to demo (**technical need**?!)
  - **Use high quality samples for demo data** to make the best case
  - **Preferably use user samples** to showcase new instrument demo data

Potential Preliminary Data – How 2?

- How can you get preliminary data if you don't yet have the instrument you are proposing the S10 grant for ?

- Potentially connect with a **colleague or collaborator who already has the desired instrument in their lab/core** - and maybe acquire collaborative data/samples prior to application
  - Potential Jump Start – but not easy to achieve
  - **Requires long logistical planning**

- Usually working with instrument vendors is easy/easier ? as they like to sell their instruments and like to help their customers in any way !!!– they are usually very supportive to obtain preliminary data.

Potential Preliminary Data

- Know exactly what preliminary data you like to acquire
- What new **S10 instrument features you like to highlight** ?
- **Unique capabilities** you currently do not have in the core/lab

- For specific projects/users what have you worked on together? and then what would this new instrument enable that is not possible now?

- What **scientific project features do you like to highlight** along the way (even though it is about the instrument), but it does not hurt to demonstrate with a nice scientific project from your users

Preliminary Data – What?

- Potentially, directly compare S10 demo to data set from user on your current instrument

Data 2019
for
S10 2020

Performance comparison

Identifications of proteins (#)

Buck instrument 2019 (blue)
vs
S10 proposed demo (red):

Medium spiny neurons (MSN) from iPSC (Huntington/C116 corrected)

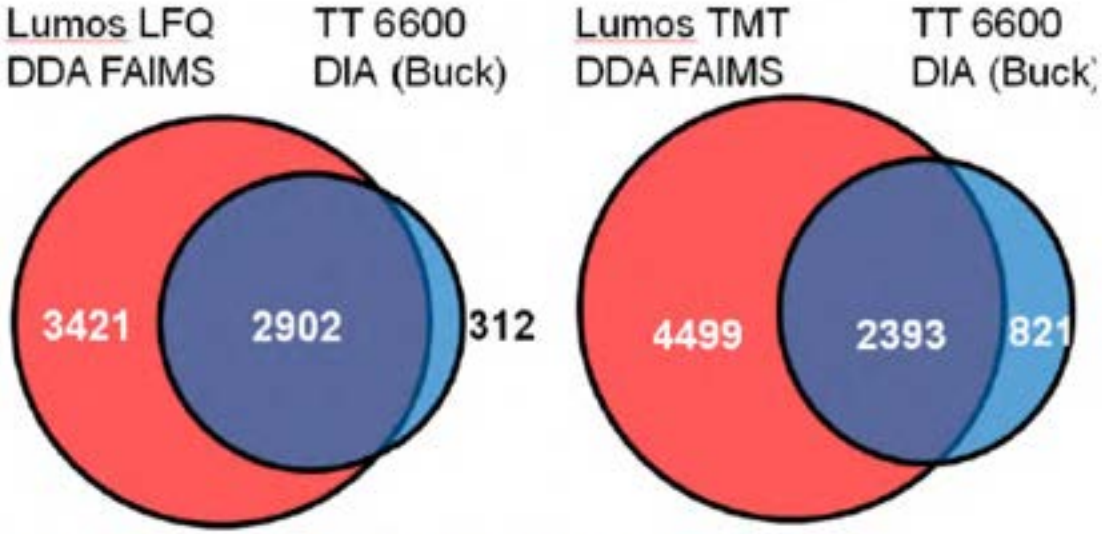


Fig. 1. Overlap of identified proteins comparing Buck Institute TripleTOF 6600 and Thermo Lumos with different scan types: DIA (Buck), DDA FAIMS with LFQ (Lumos) and DDA FAIMS with TMT multiplexing (Lumos).

Obtained with vendor

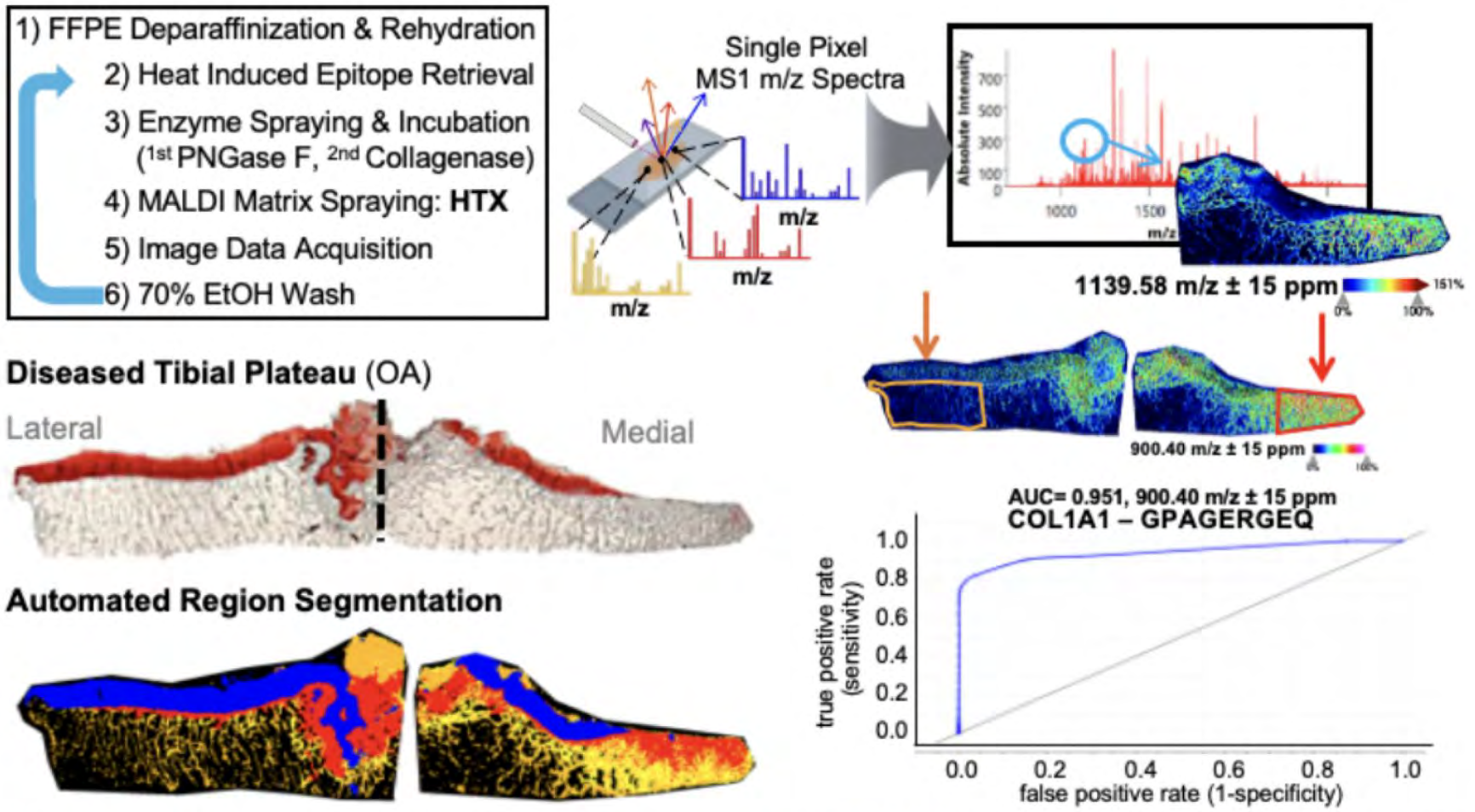
Preliminary Data – Novel Capabilities

- Demonstrate something that you can not do at all with your current instrumentation
- Scientific new data obtained that will greatly benefit the projects of your major and minor users
- Either leap over existing instrumentation
- Or something totally novel – in my case : spatial mass spectrometry

Preliminary Data – Project 1 Osteoarthritis

➢Highlight user projects with new proposed S10 technology:

Spatial
Mass Spectrometry

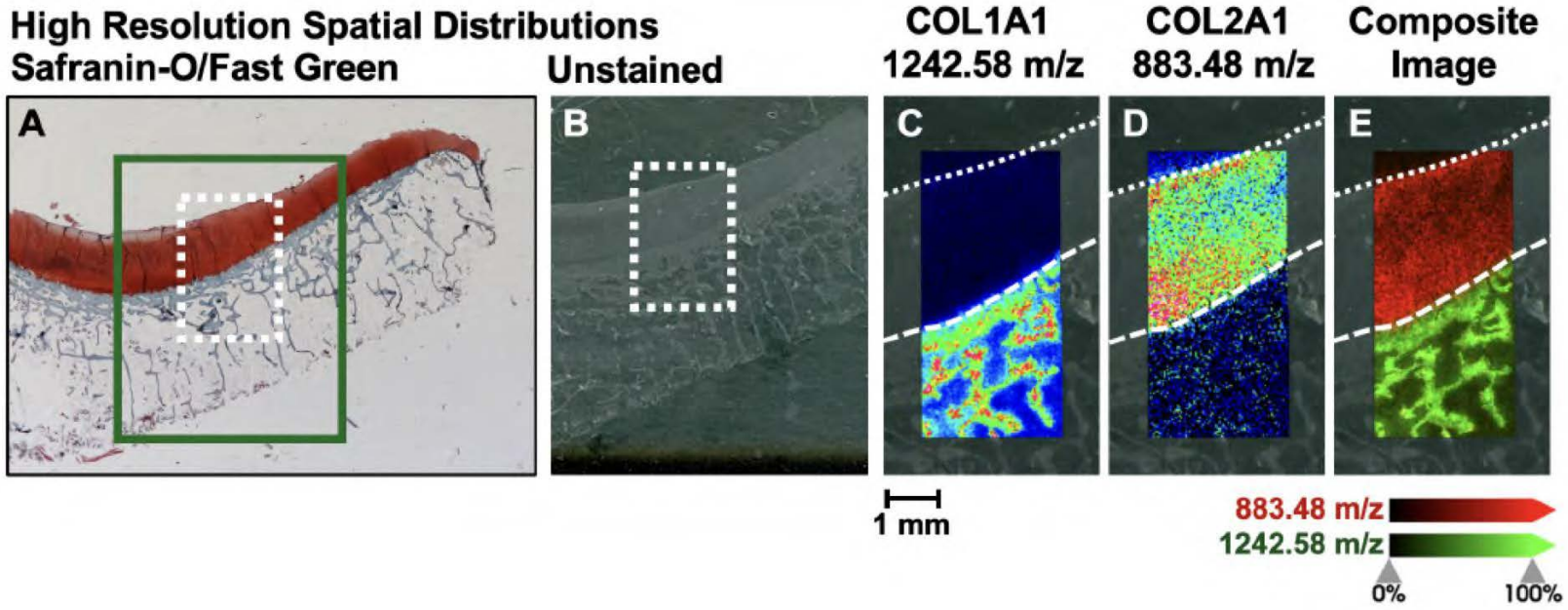


MALDI MS Imaging workflow for Buck/UCSF human knee joints. Protocol

Preliminary Data – Project 1 Osteoarthritis 2

➢Highlight user projects with new proposed S10 technology:

Spatial
Mass Spectrometry

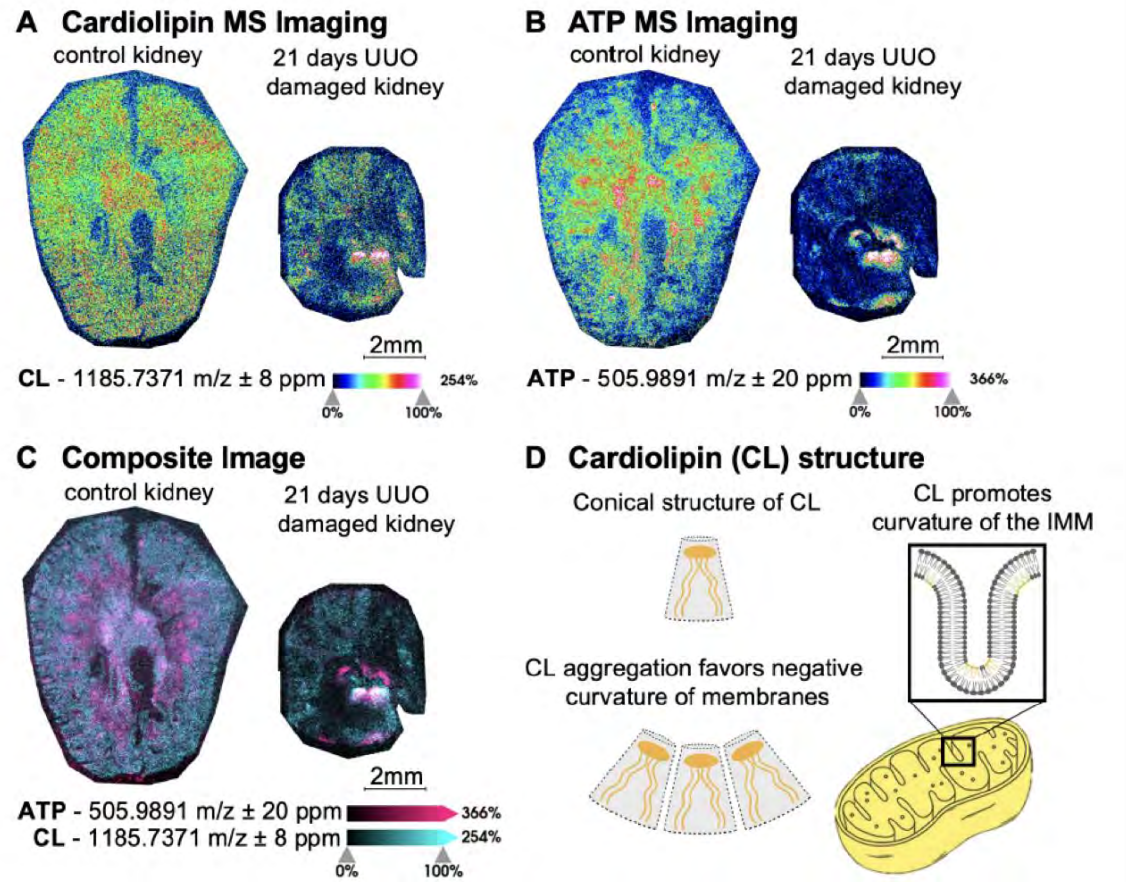


High Spatial Resolution revealing distinct architectural features in articular bone/cartilage of human knee joint. A. Histologic Safranin-O Fast Green stain (cartilage in red, on top) and bone underneath (appearing 'white'), **B.** unstained tissue from cadaveric healthy human tibial plateau. High resolution (20 µm) MALDI-MSI images from proteins **C.** Col1A1 - GPAGARGNDGATGAA (bone marker) at m/z 1242.58 ± 15 ppm in lower tissue area, **D.** Col2A1 - GPQGLAGQR (cartilage marker) at m/z 883.48 ± 15 ppm in upper tissue area, and **E.** composite image overlay showing distinct separation of the respective tissues *(Alliston, Project 1 prelim. data).*

Preliminary Data – Project 3 Kidney Injury

➢Highlight user projects with new proposed S10 technology:

Spatial
Mass Spectrometry

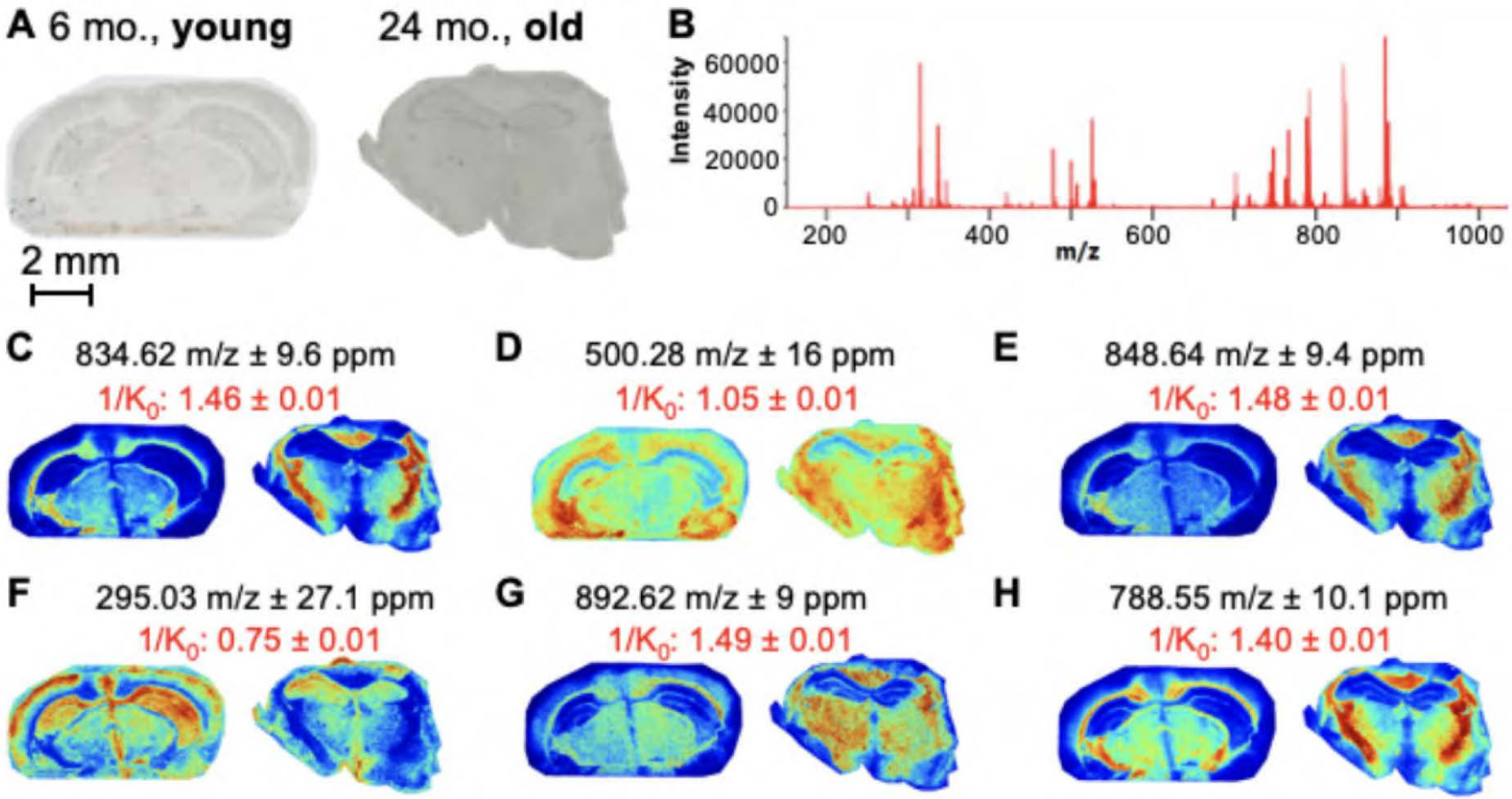


Multi-omic MS Imaging in kidney - simultaneously measuring lipids and metabolites. MS Imaging in negative ion mode of a WT mouse with a control kidney (left) and a kidney from a mouse that received 21 days of Unilateral Ureteral Obstruction (UUO) to induce severe kidney

Preliminary Data – Project 2 Brain Aging / AD

➢Highlight user projects with new proposed S10 technology:

Spatial
Mass Spectrometry



Lipid Imaging of mouse brain at ages 6 months (young) and 24 months (old).

Preliminary Data – Novel Capabilities 2

- Preliminary data can be extremely tailored to the major and minor users as part of the S10 instrument applications

- Why do your users really need this S10 instrument

- **How do your users benefit from having this S10 instrument**, what kind of new data (different data) can your users obtain – other than what you already provide to them --- the preliminary data can highlight that

- **Merging state-of-the art technology/instrumentation with high end biological projects** (from your users) – so using their samples for preliminary data can be particularly powerful

Preliminary Data – from theory to real experiments

- While preliminary data are not required they can show
  - Your projects work with this new technology
  - Interesting data/results are obtained – with new directions ….
  - Experimental paradigms are aligned and possible with this S10 instrument that you are suggesting – increasing the likelihood of ‘success’ for your major/minor users who are part of your S10 application

Better insights what this instrument can really do

- Preliminary data will provide you with **additional insights what the real strengths are of the proposed S10 instrument** :
  - i) in your own experience
  - ii) with your own users' samples
  - iii) with your own scientific questions
- Generate excitement around data, results, users, capabilities…
- **Generate true vision for the future with this new S10 instrument**
- **In your specific core or lab --- for your users !!!**

Preliminary Data as Special Asset

- THANK YOU ALL

ORIP

- To all the major and minor users
- Also to all the instrument vendors and their help with S10 applications