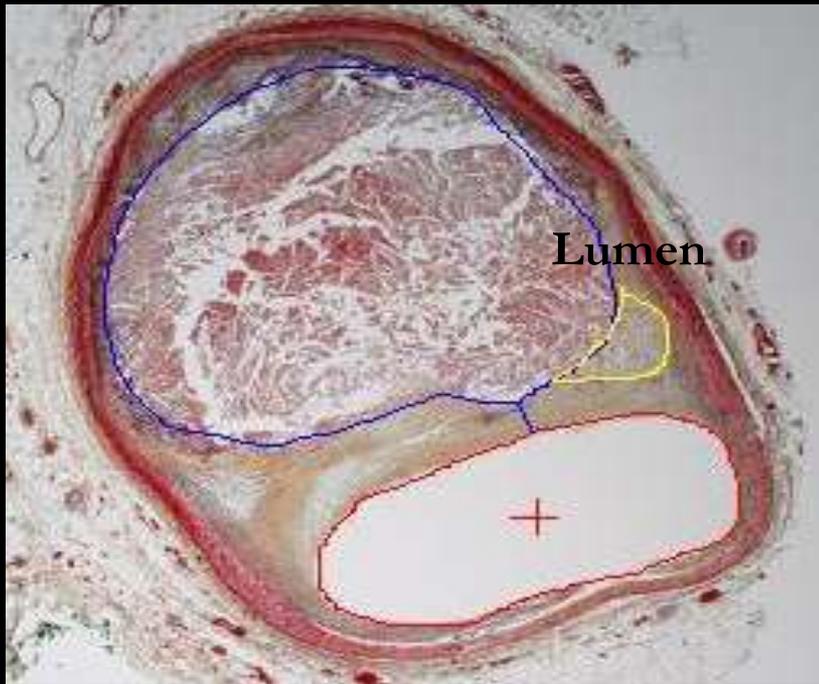


TCTAP April 2015

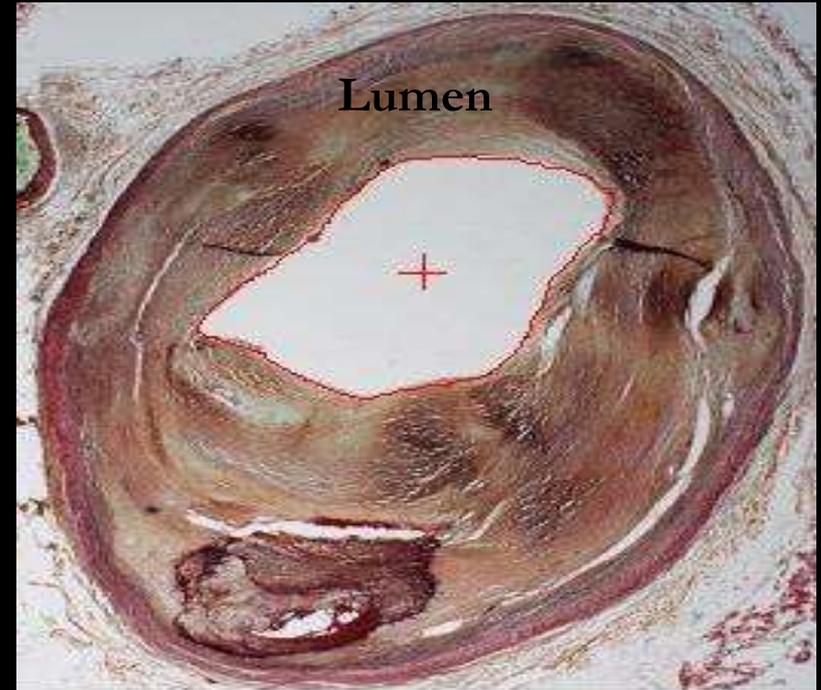
**Will Combined IVUS-NIRS Imaging Improve Our Ability
to Predict Culprit Lesions?**

James Muller MD
Chief Medical Officer
Infraredx, Inc.

NIRS can differentiate two different types of plaques.



Lipid-Rich Plaque



Fibrotic / Calcified Plaque

Near-IR Spectroscopy (NIRS)-IVUS Combination Coronary Imaging System

Advanced TVC
Imaging System



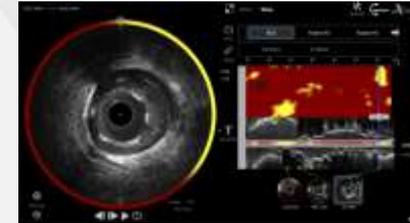
Nexus Controller



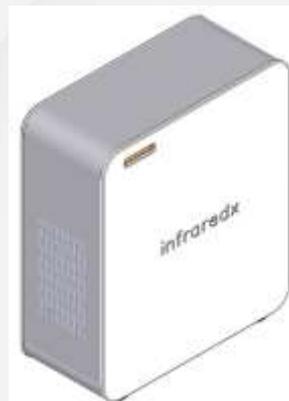
Muller Catheter



Chemogram



MC9i Integrated Console



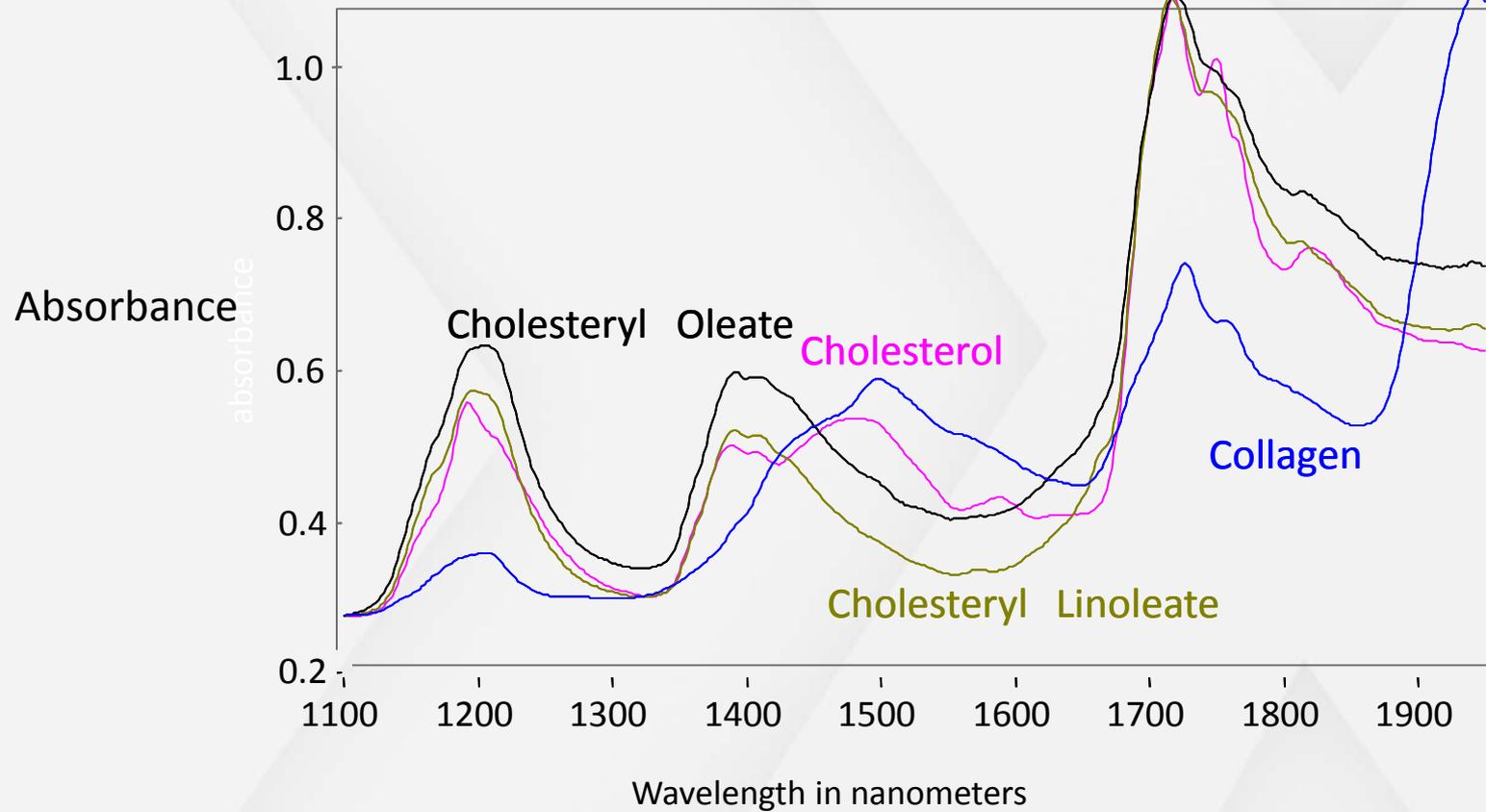
Mobile Console – Advanced TVC Imaging System

- Best-in-class 20 micron axial resolution
- Improved user interface
- Low profile, modern design

Integrated Console – MC9i

- Seamless integration into cath lab

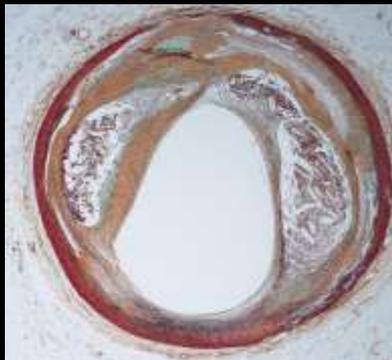
Near Infrared Spectroscopy (NIRS) to Identify Chemical Composition



Spectroscopy in 1998

Chemogram Findings in a Coronary Autopsy Specimen

Comparison with Histology



40 mm



36 mm

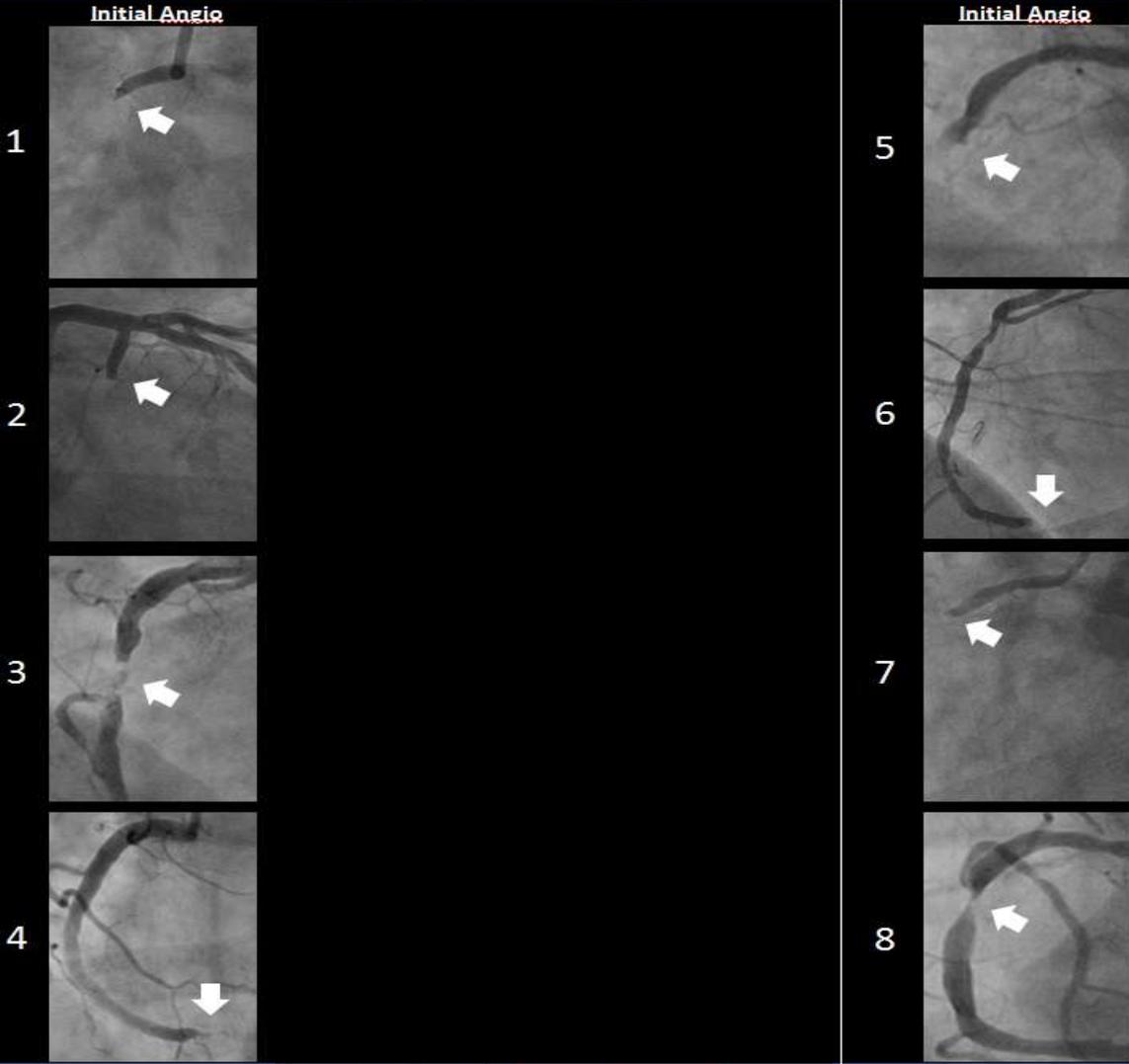


26 mm



20 mm

NIRS Signature of MI



Source: Madder et al., JACC Interventions, 2013

The Lipid-rich Plaque (LRP) Study

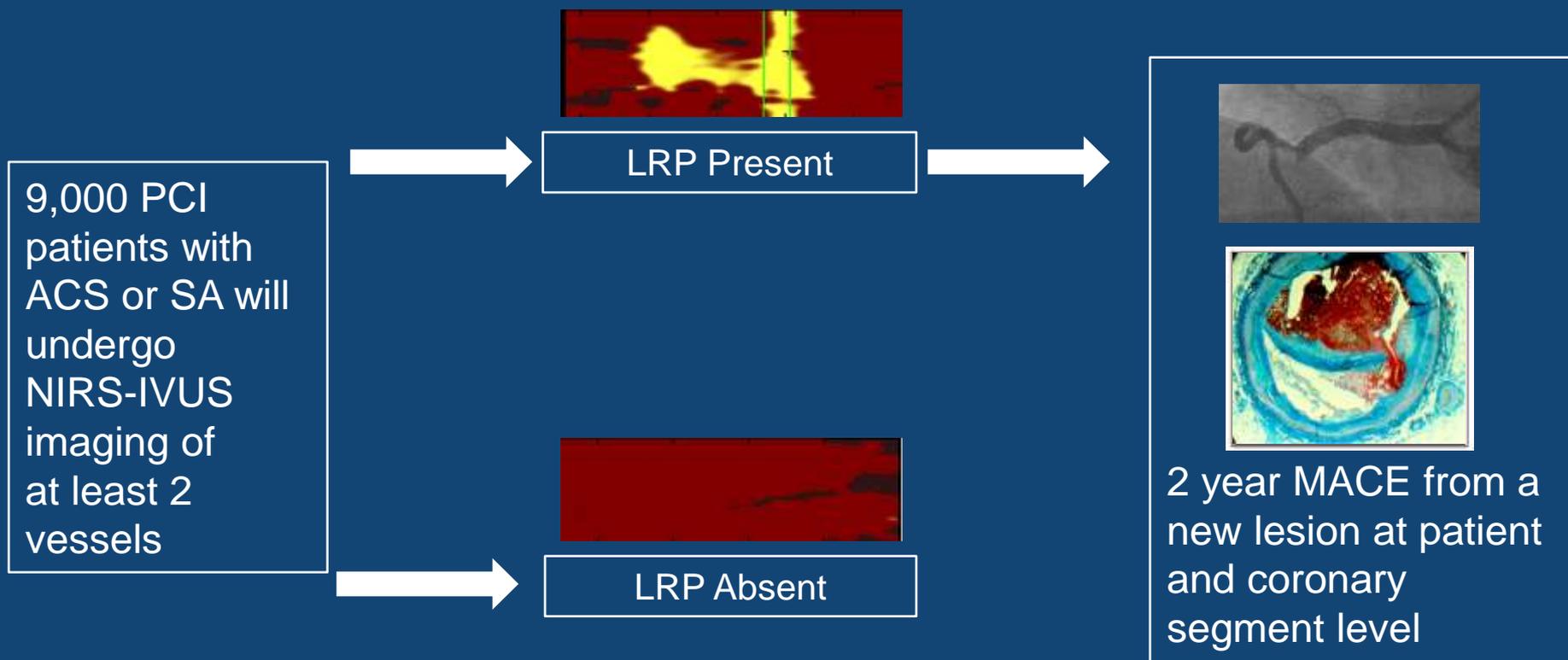
Dr. Ron Waksman, PI

PI, Japan, Dr. Takashi Akasaka

Co-PI, Japan, Dr. Yasunori Ueda

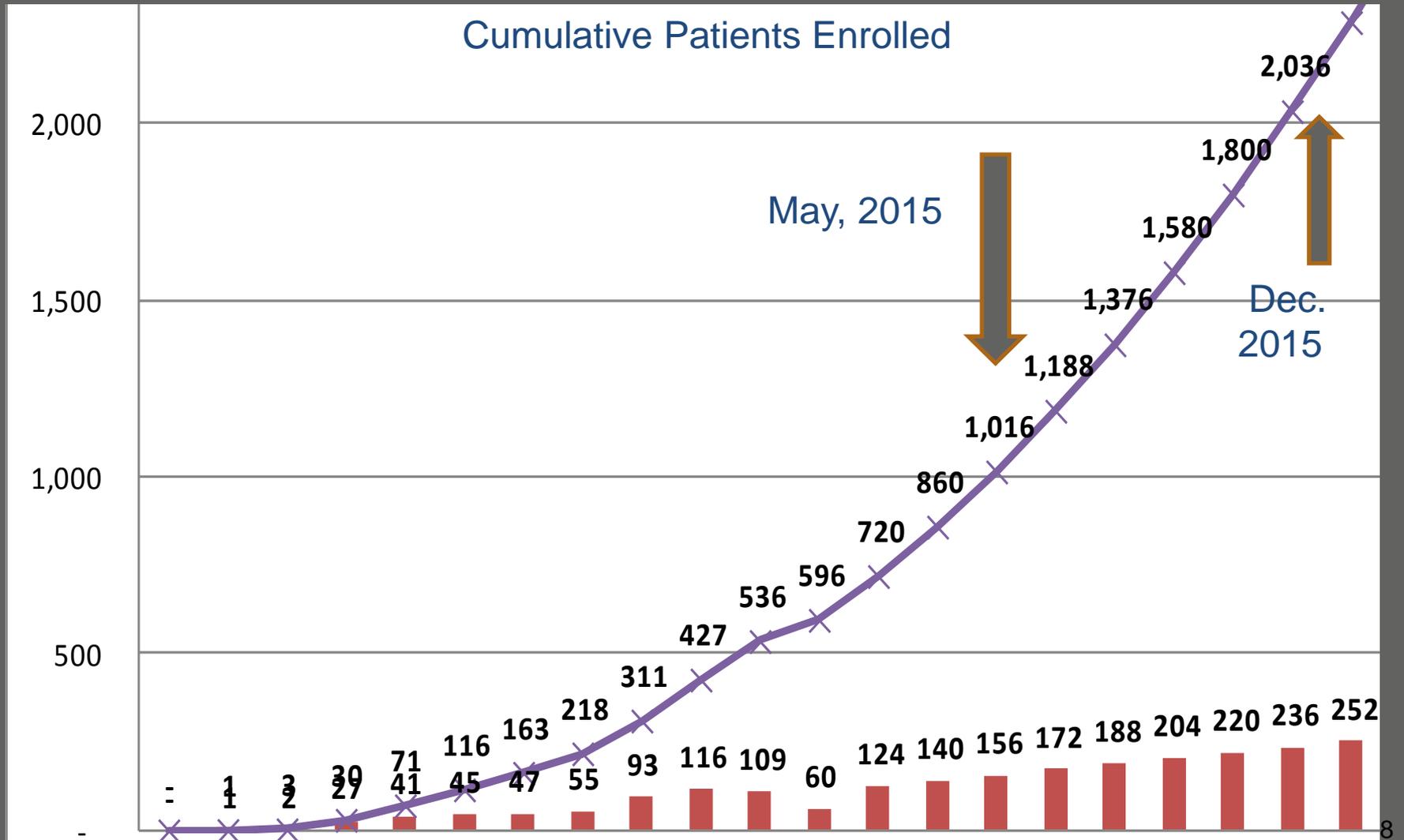
PI, Europe, Dr. Carlo Di Mario

PI, Korea, Dr. Seung-Jung Park



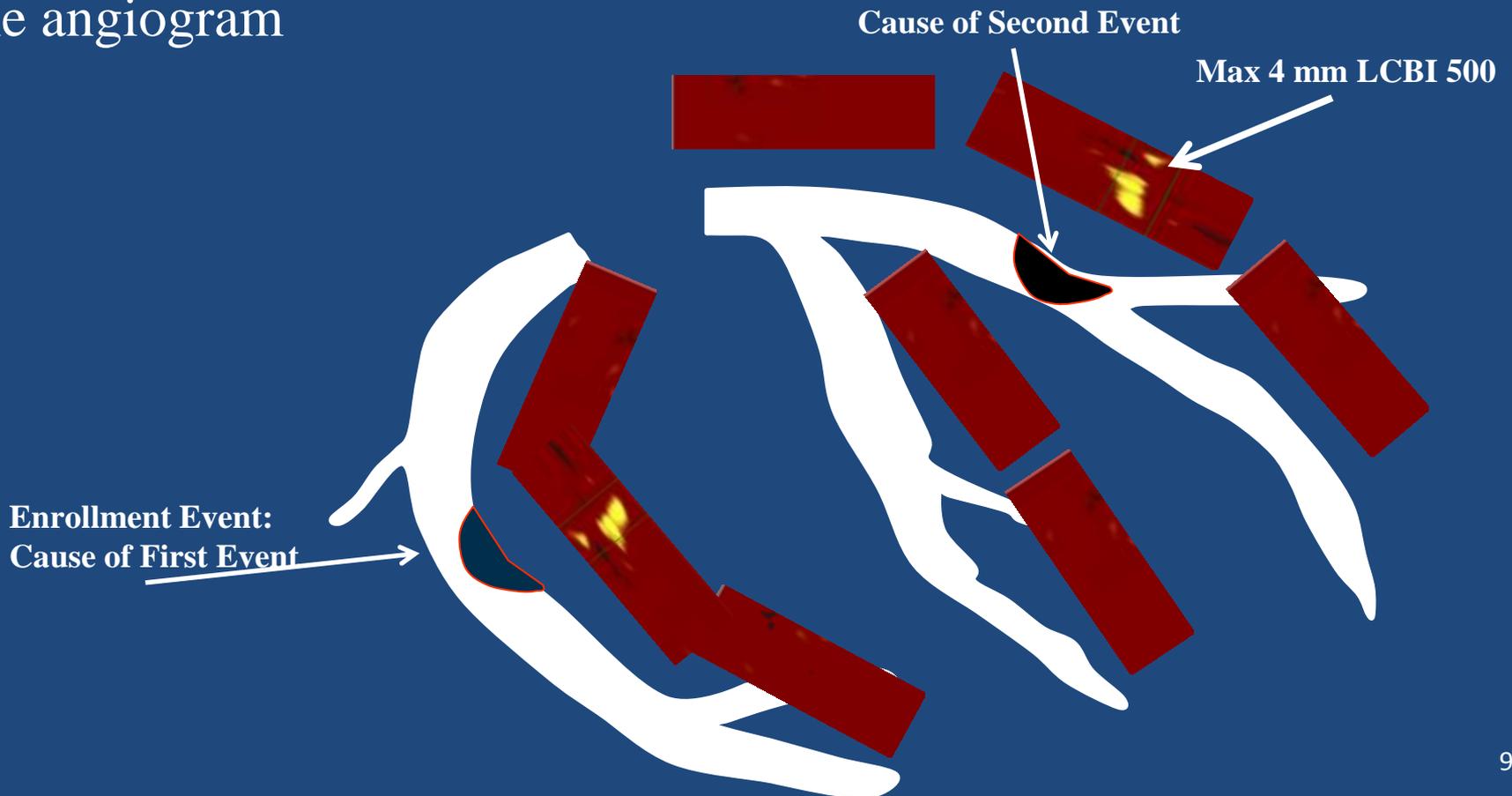
Lipid-rich Plaque Study Enrollment

Dr. Ron Waksman, PI.

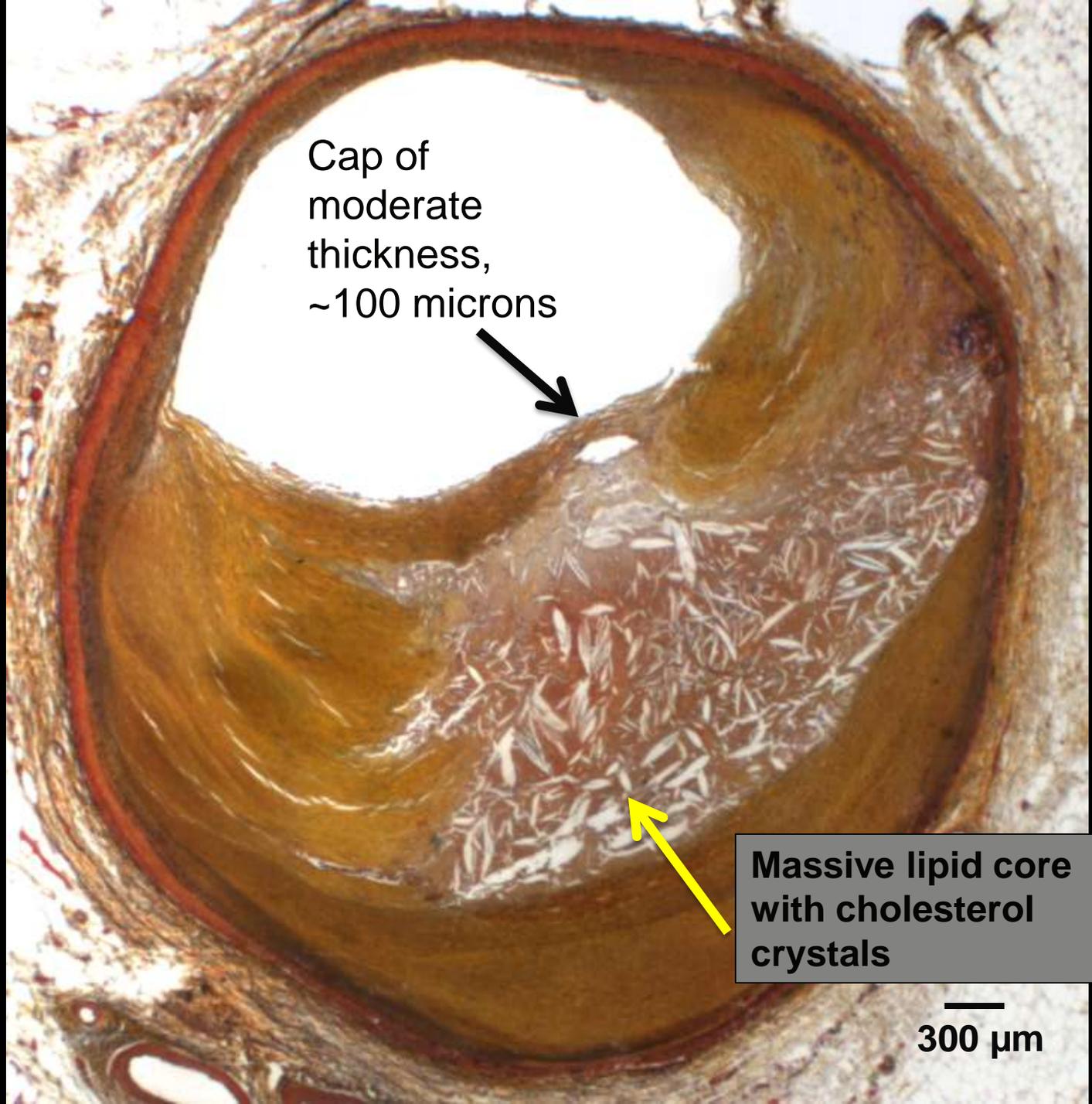


Vulnerable Plaque Methods

Coronary arteries segmented into 30 mm segments based on the angiogram

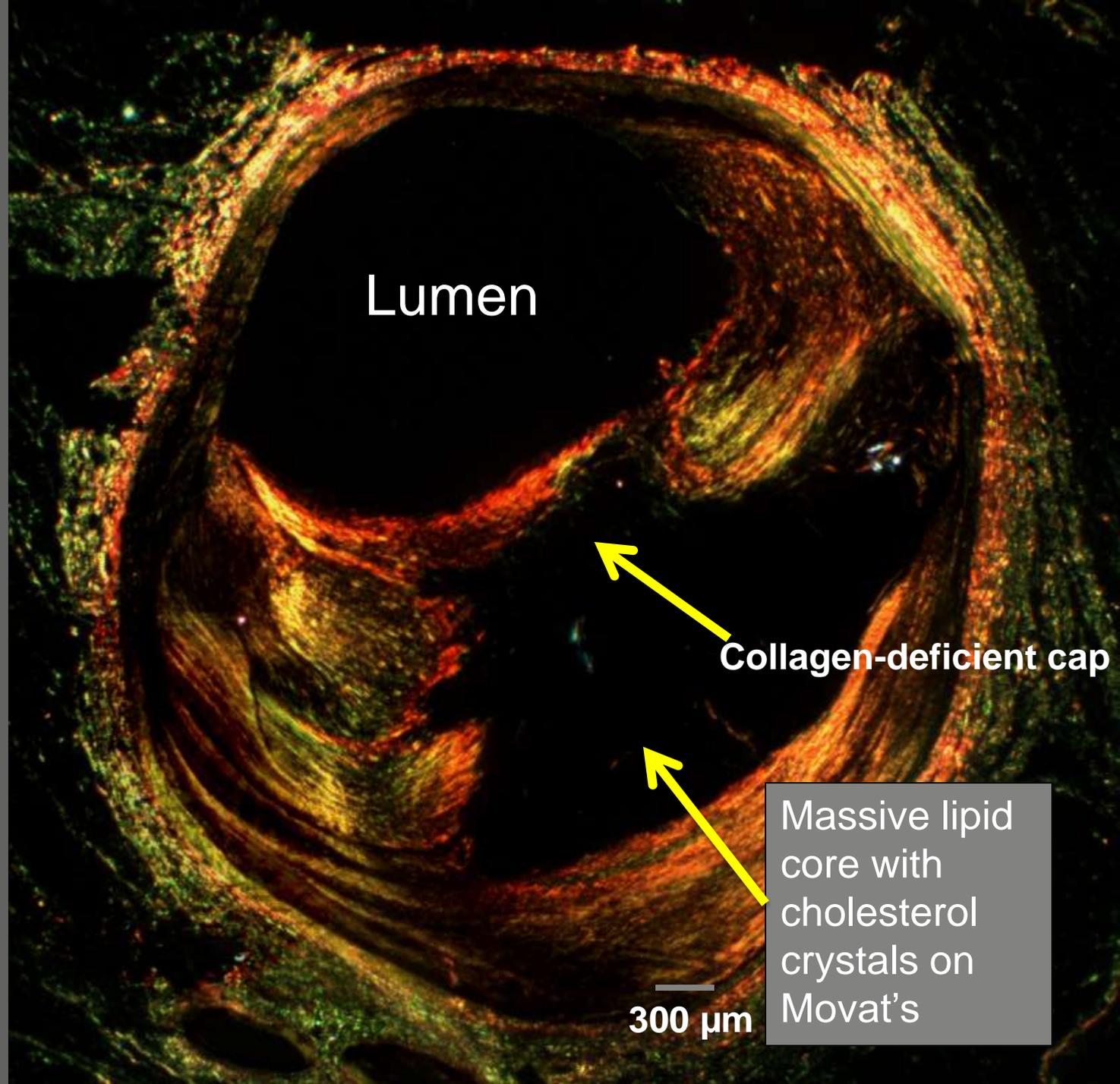


Movat's stain of coronary autopsy specimen



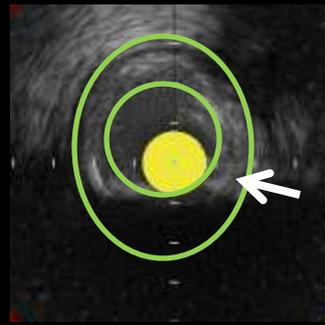
Polarized
Picrosirius
red
stain of
coronary
specimen:
detection of
collagen

NIRS
algorithm
to detect
collagen
is being
developed
to enable
detection
of weak-cap
fibroatheroma
(WCFA)
in living
patients.



Courtesy Ryan Madder, MD
Sean Madden, Ph. D and
Joel Raichlen, MD
*preliminary algorithm

-- A large
plaque
burden
by IVUS



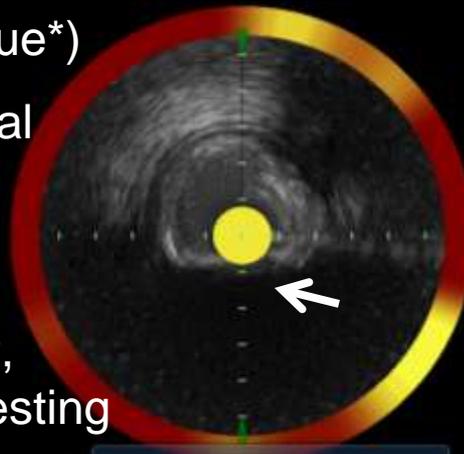
-- A large
lipid core
by NIRS



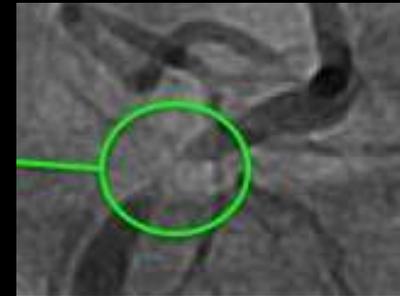
-- Low
collagen
cap by
NIRS (blue*)



-- Superficial
attenuated
plaque by
IVUS at
yellow spot,
also suggesting
weak cap



7 months
later, new
unstable
angina



NIRS-IVUS
TVC imaging
Shows LRP plus ---

Vulnerable Plaque Index

VPI = LCBI + Plaque Burden
+ Collagen-deficient cap
- Calcified cap
+ Low shear

Is this
non-stenotic
plaque dangerous?

