

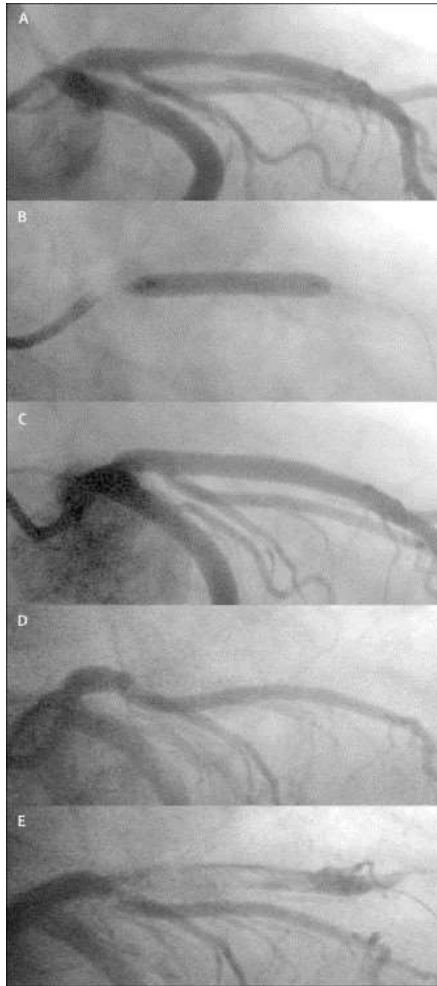
Amazing Efficacy of Biolimus A9

Implication from Pathological Studies

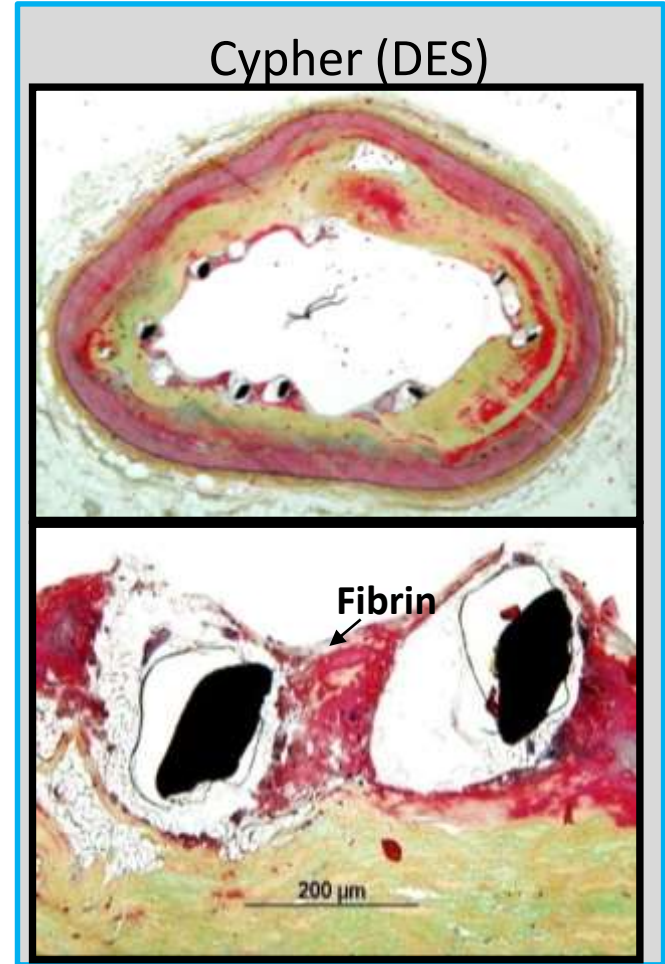
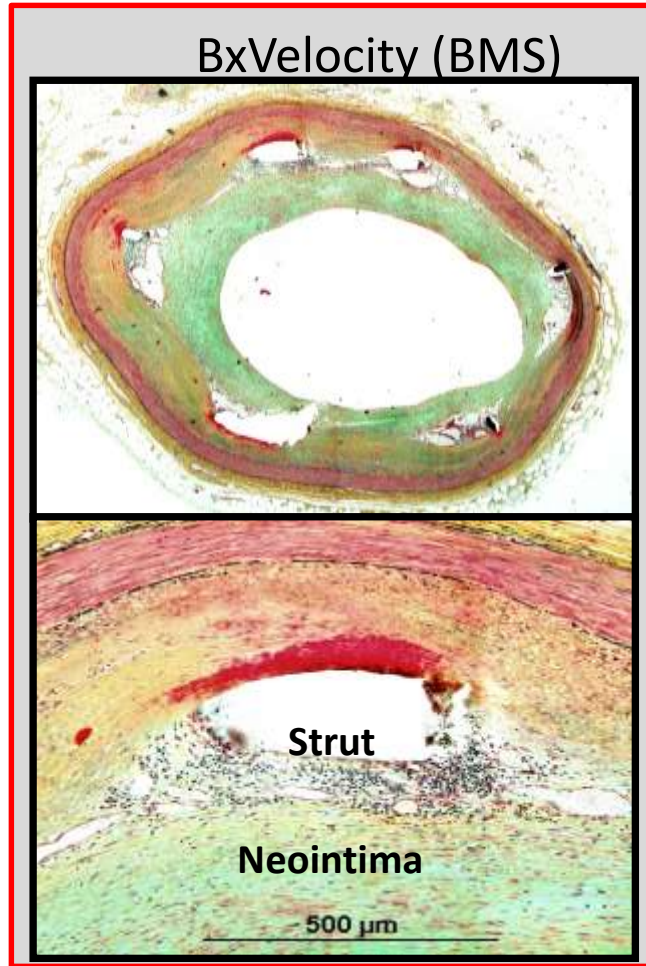
NAKAZAWA, G
TOKAI Univ.



Delayed Arterial Healing as a cause of LST



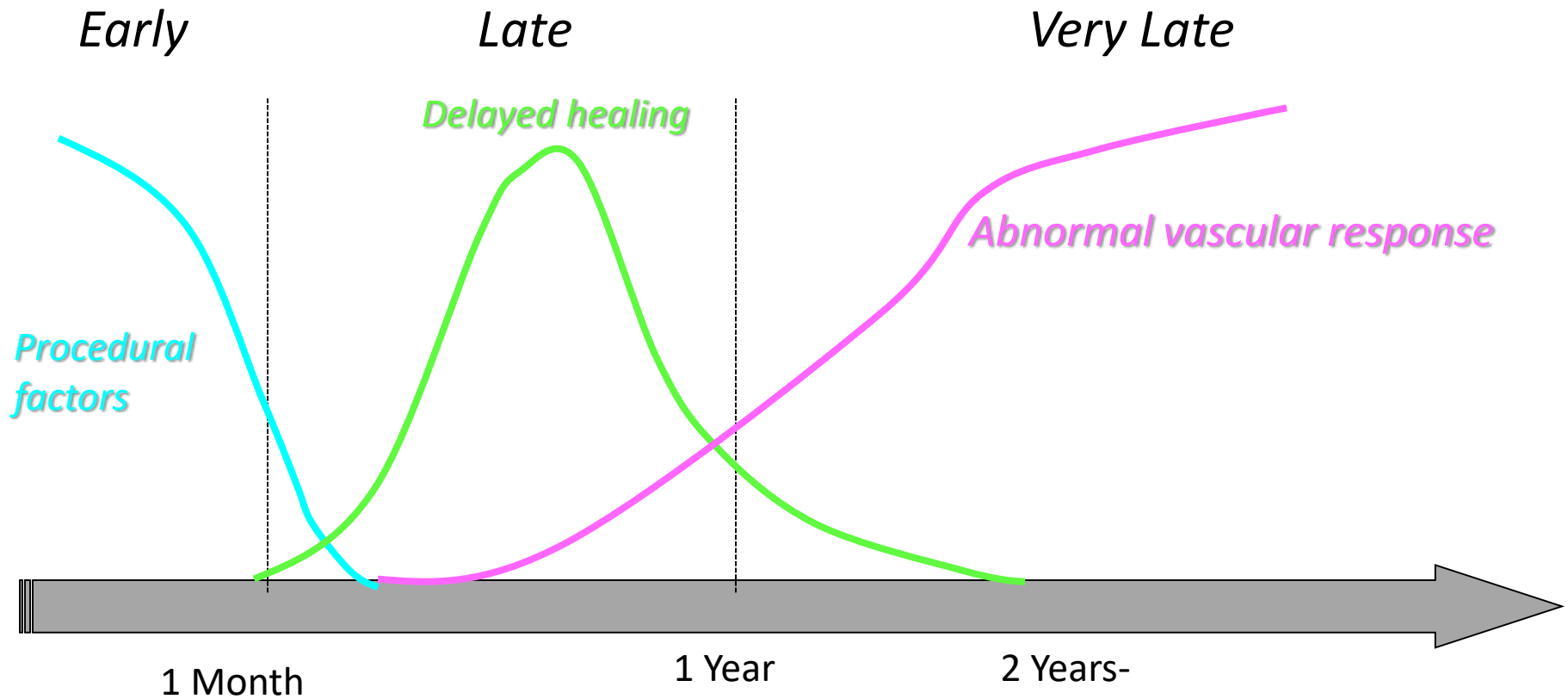
McFadden E et al. Lancet 2004



Joner M & Finn AV. J Am Coll Cardiol. 2006;48(1):193-202.



Different Mechanisms of DES failure with time

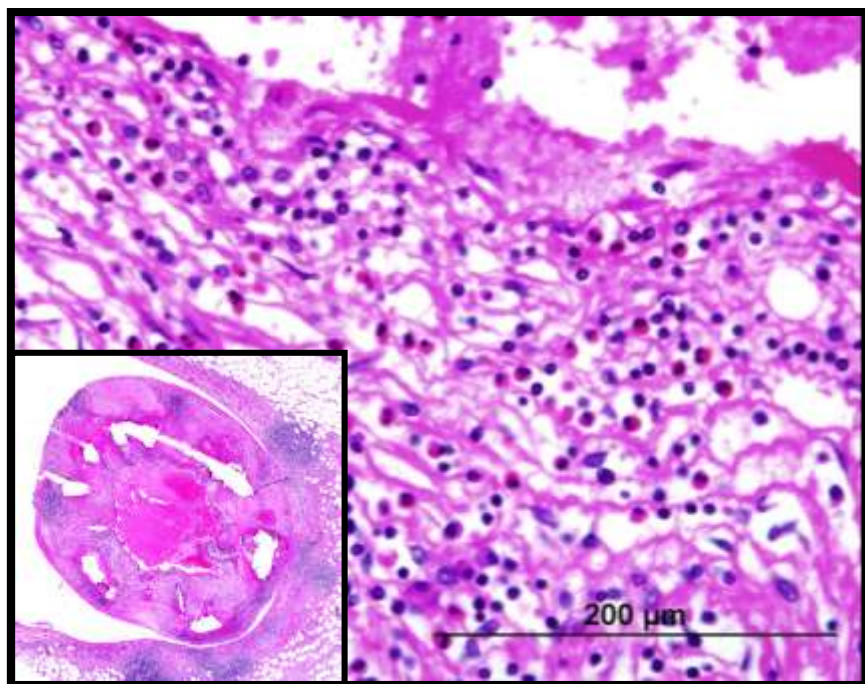


Nakazawa G, J Cardiol. 2011 Sep;58(2):84-91.



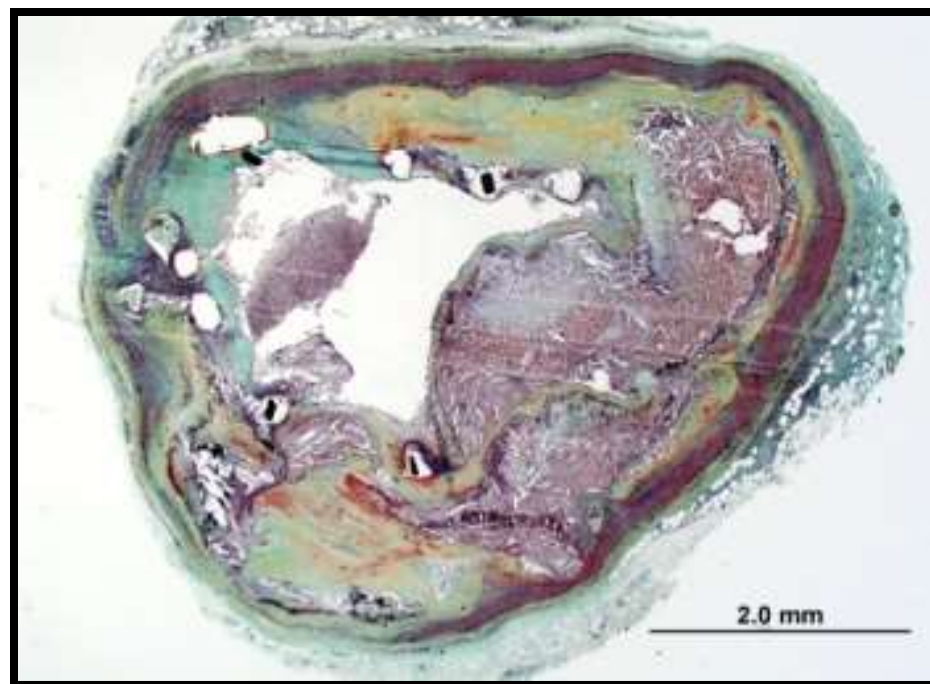
Abnormal Vascular Response

Hypersensitivity



Nakazawa, G et al. J Am Coll Cardiol 2011;57(4):390-8

Neoatherosclerosis

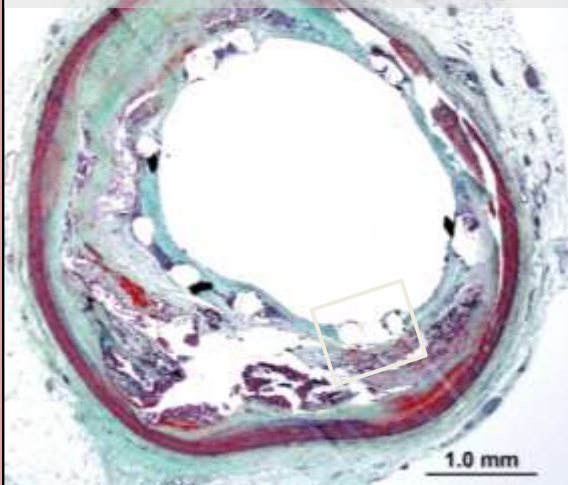


Nakazawa, G & Otsuka, F et al. J Am Coll Cardiol. 2011;57(11):1314-22.

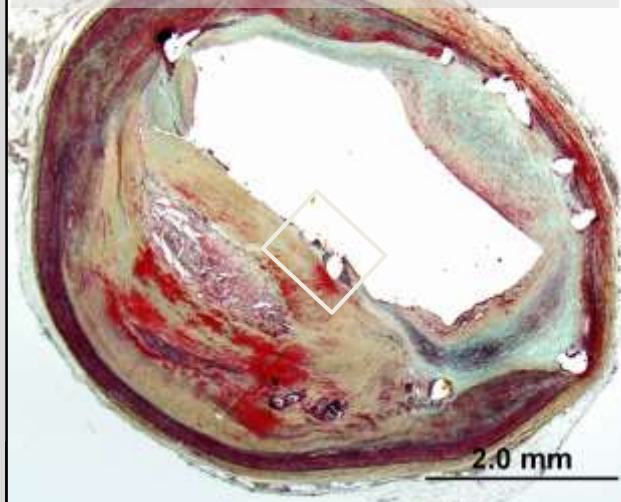
Histologic findings in 2nd Gen DES at autopsy

1st-generation DES

SES 13 months

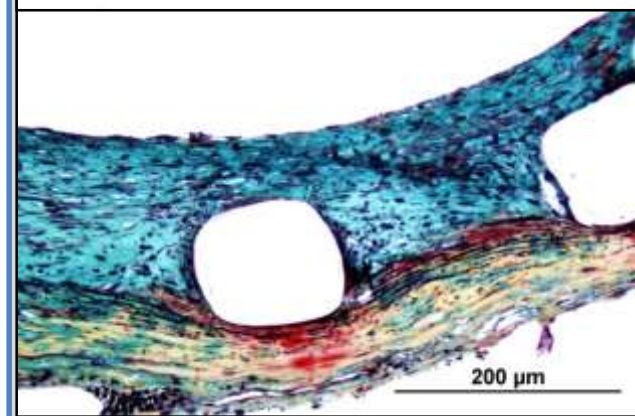
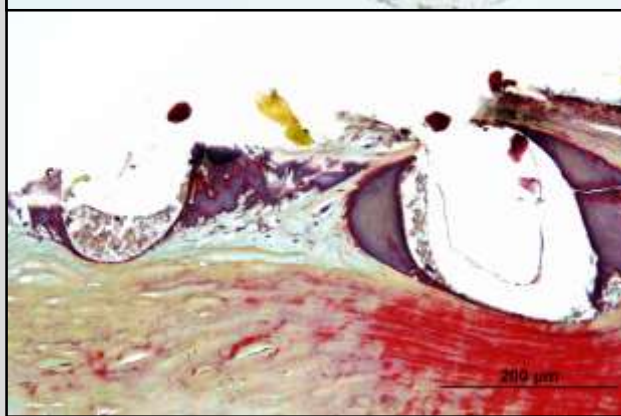
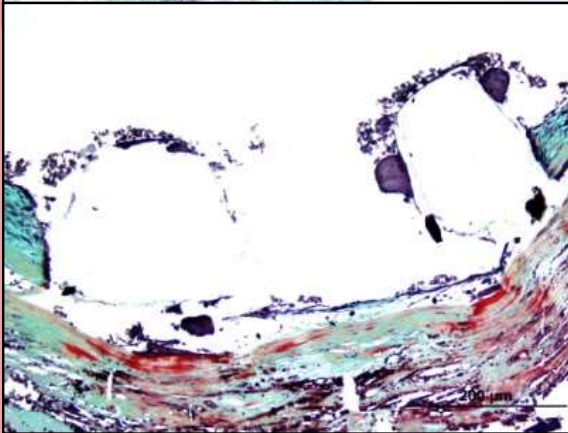
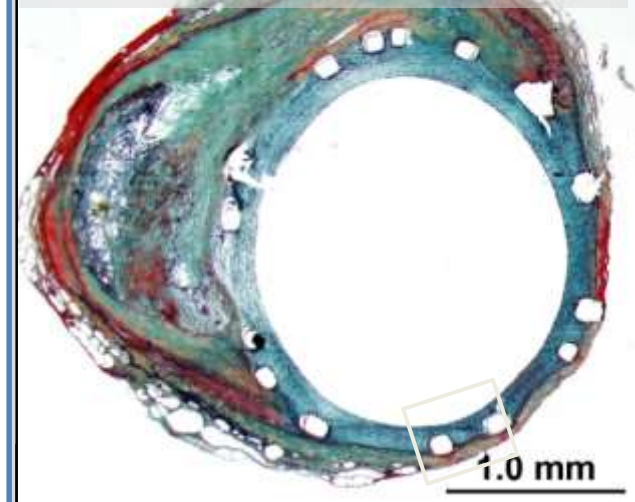


PES 11 months



2nd-generation DES (EES)

EES 6 months

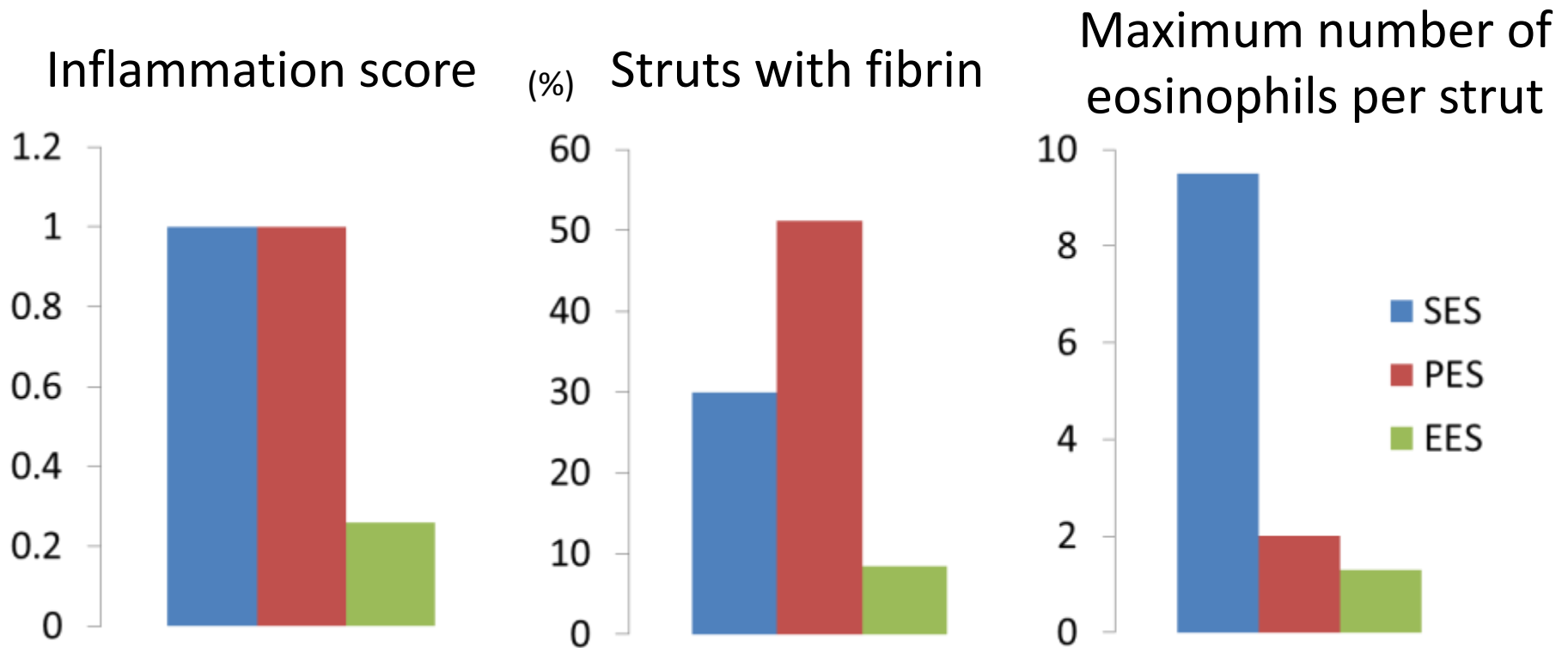


Otsuka F et al. Circulation. 2014;129:211-223



Vascular response in 2nd Generation DES

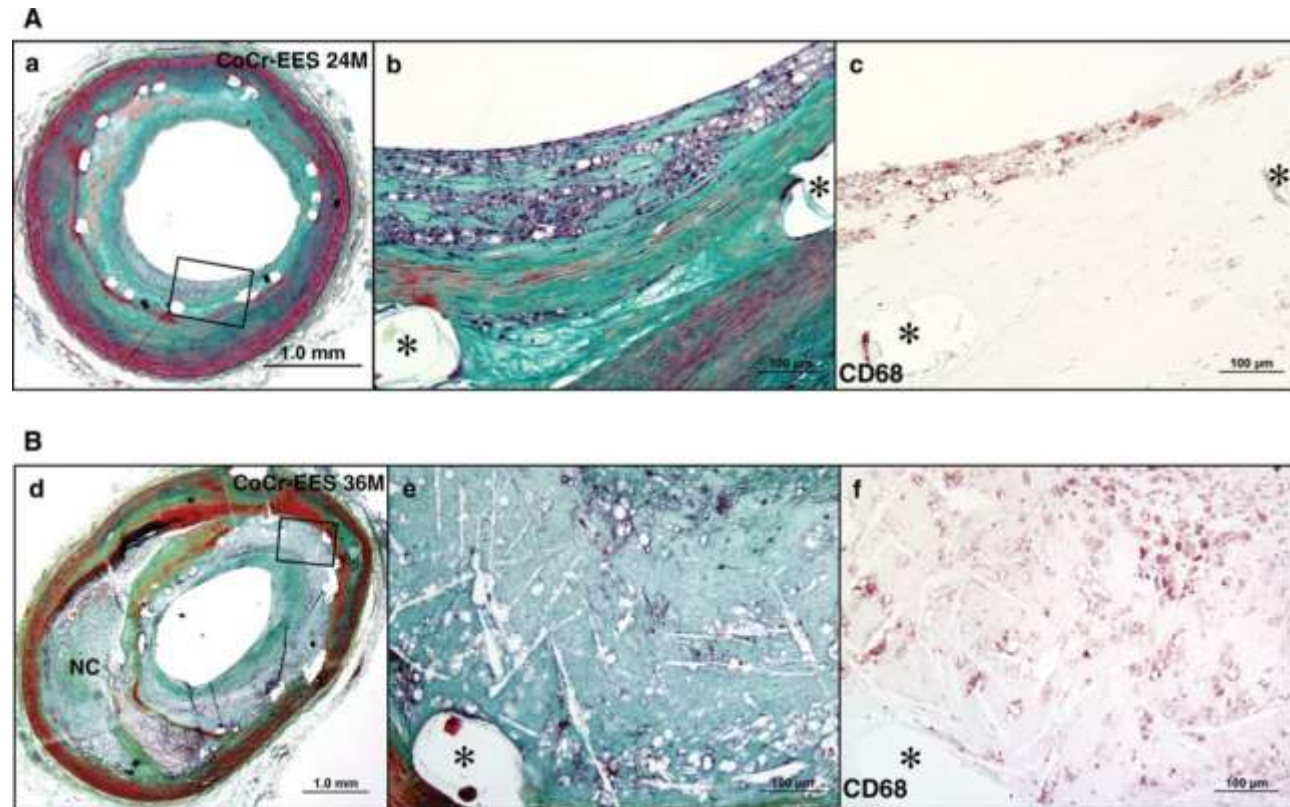
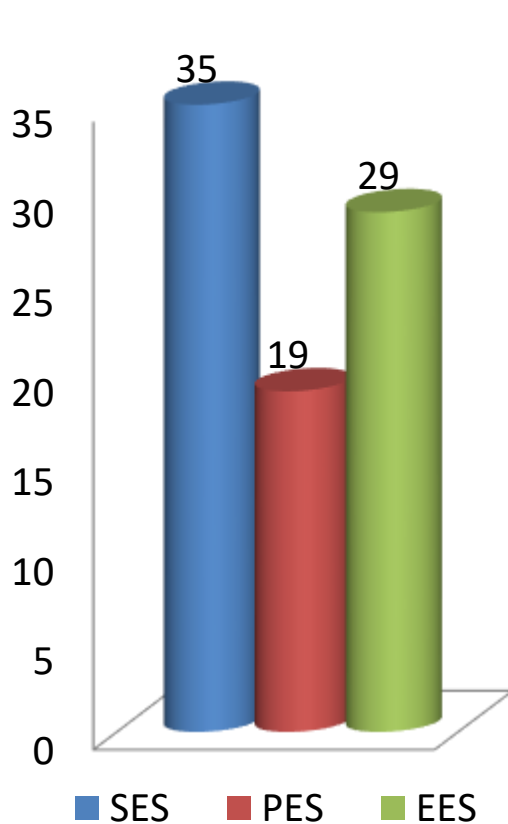
Everolimus eluting stents vs. 1st gen DES



Otsuka F et al. Circulation. 2014;129:211-223

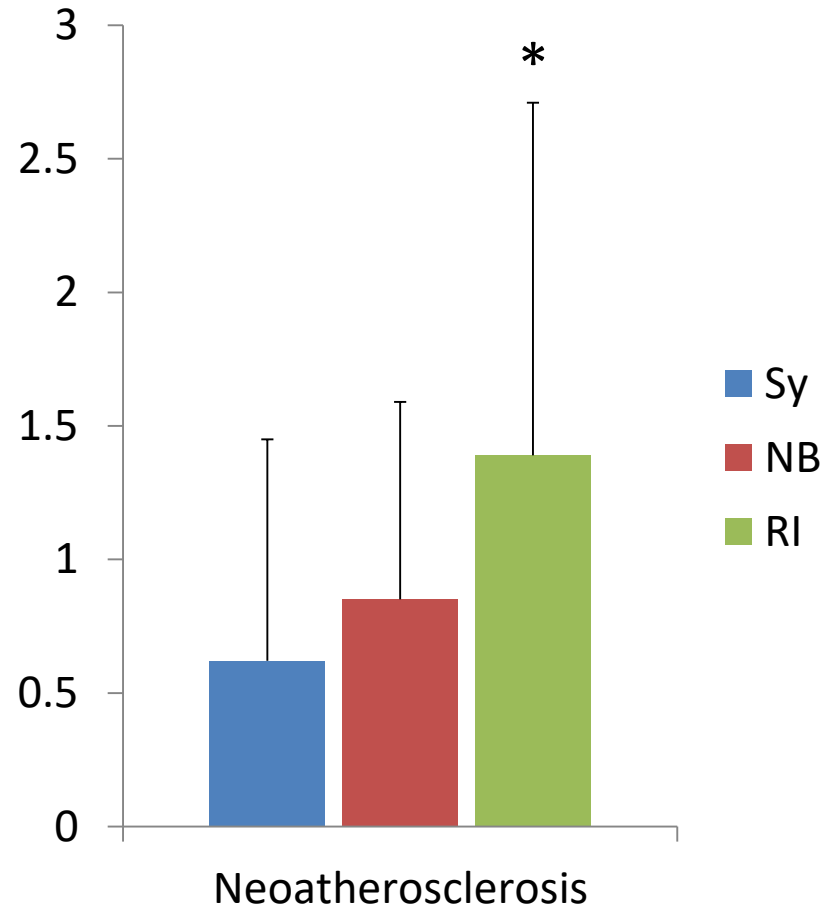
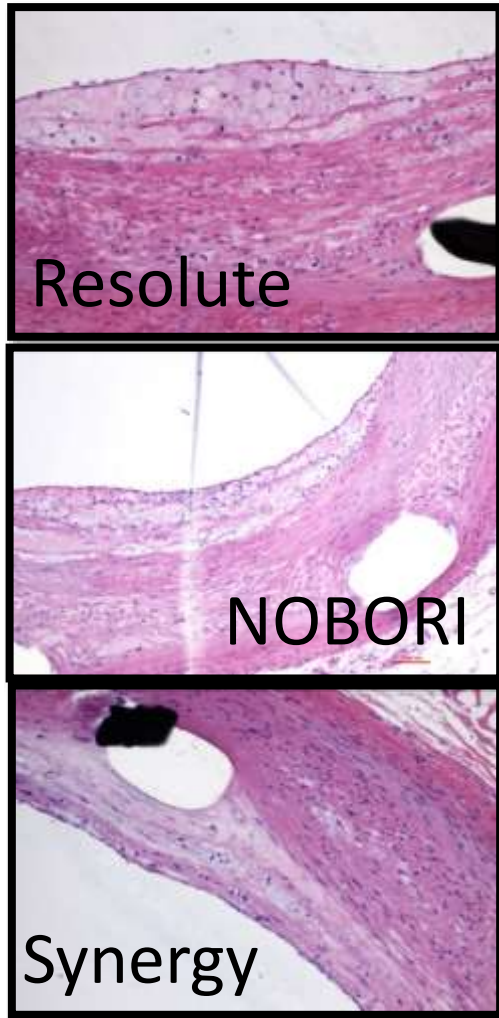


Incidence of Neoatherosclerosis in EES



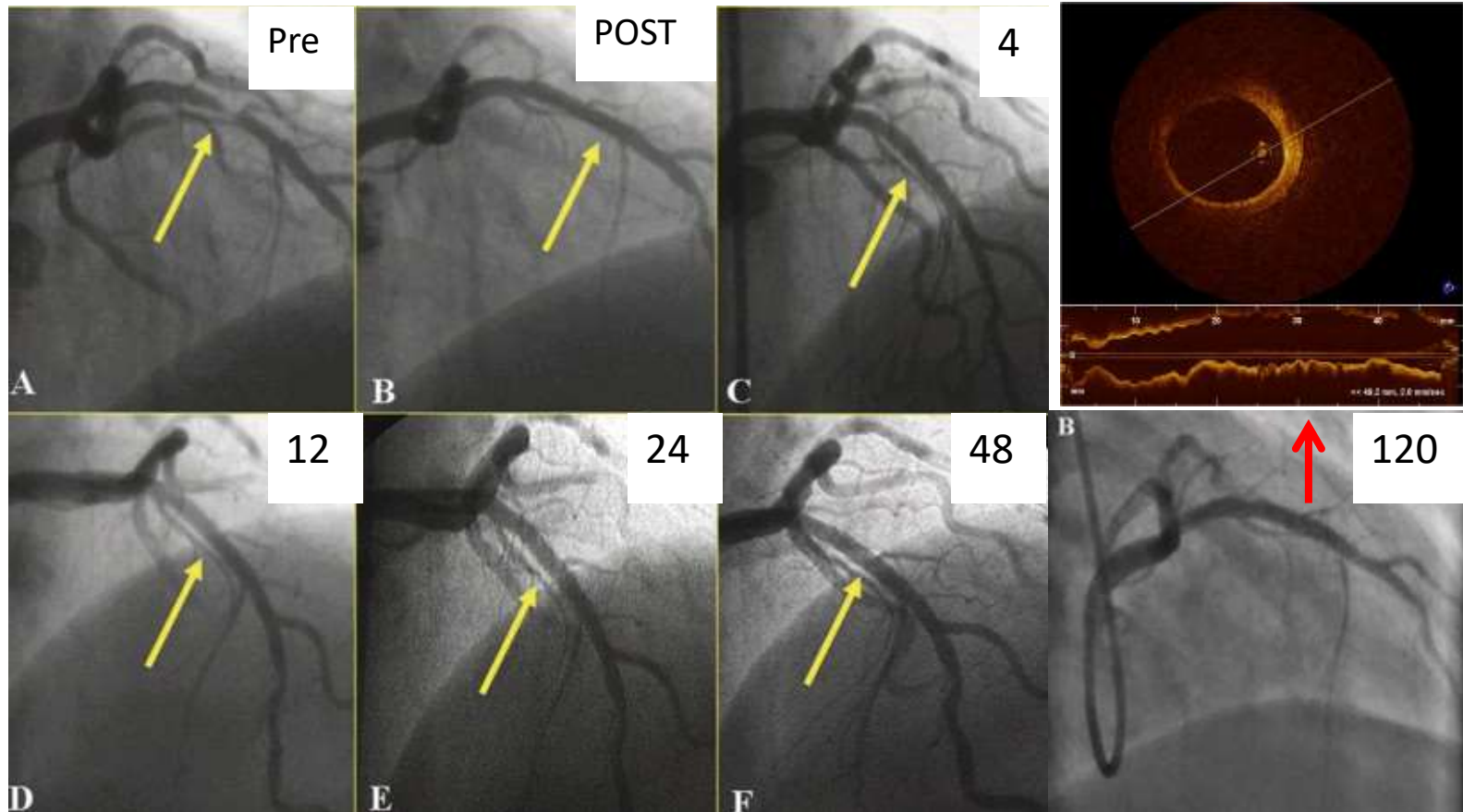
Otsuka F, et al. Circulation. 2014 Jan 14;129(2):211-23

Neoatherosclerosis in Athero-Rabbit Model



Nakazawa G et al. J Am Heart Assoc. 2016 Oct 19;5(10).

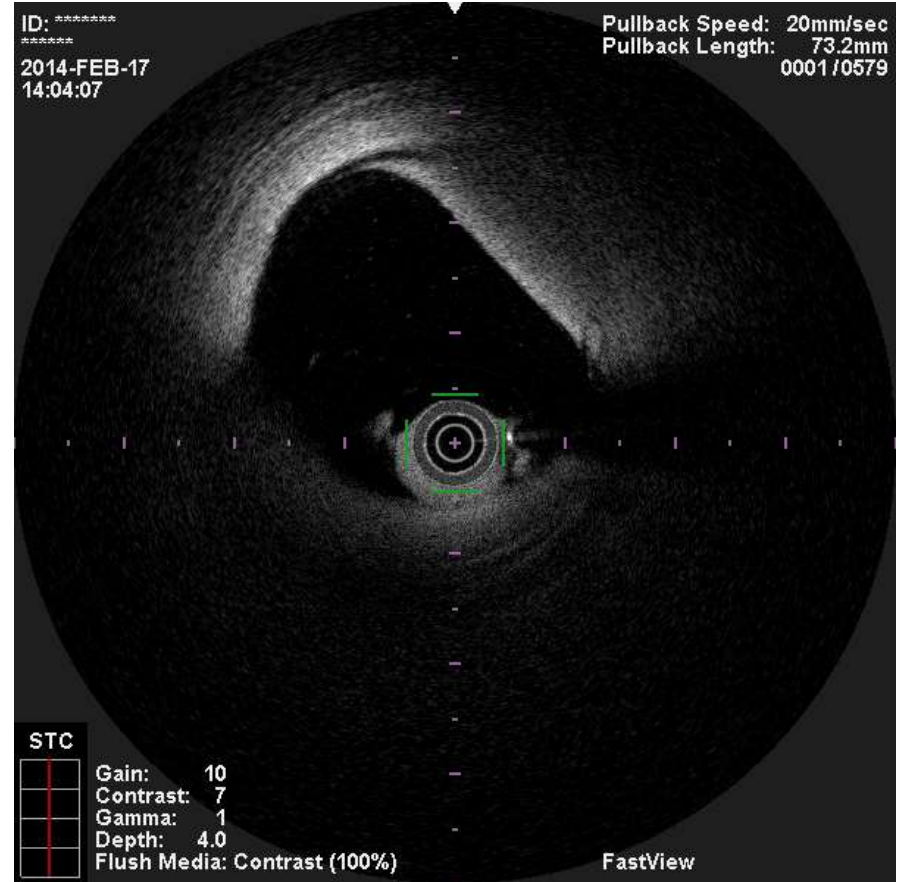
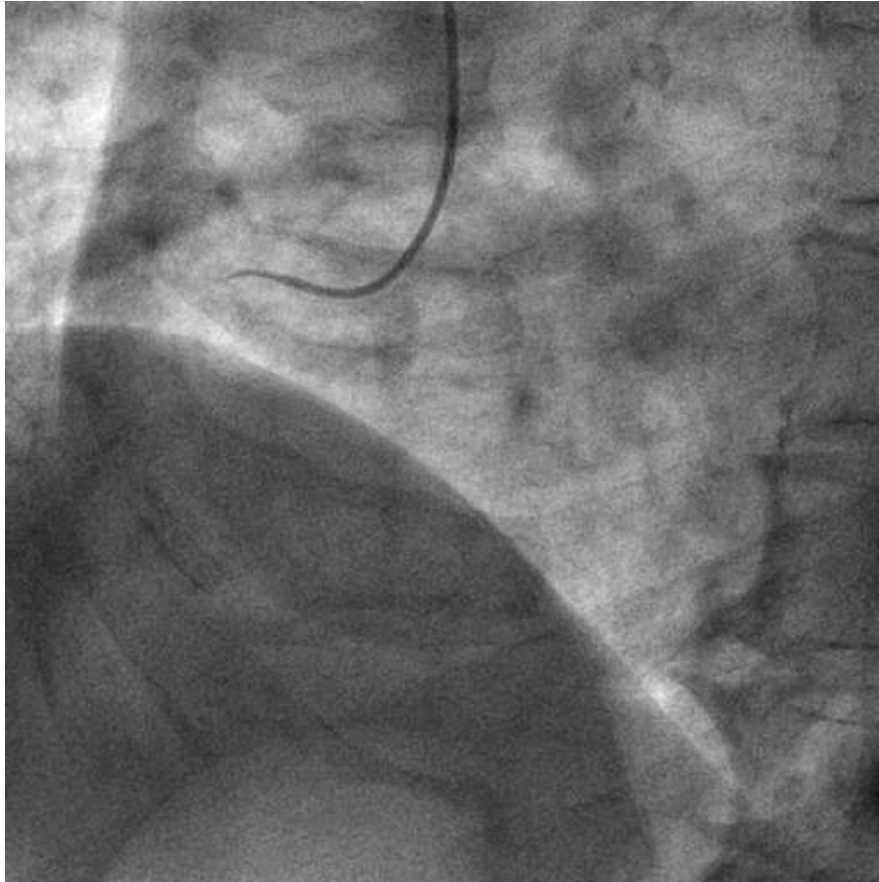
Cypher 10-year follow-up



J. Eduardo Sousa et al JACC: Cardiovascular Interventions, Volume 3, Issue 5, 2010, 556 - 558

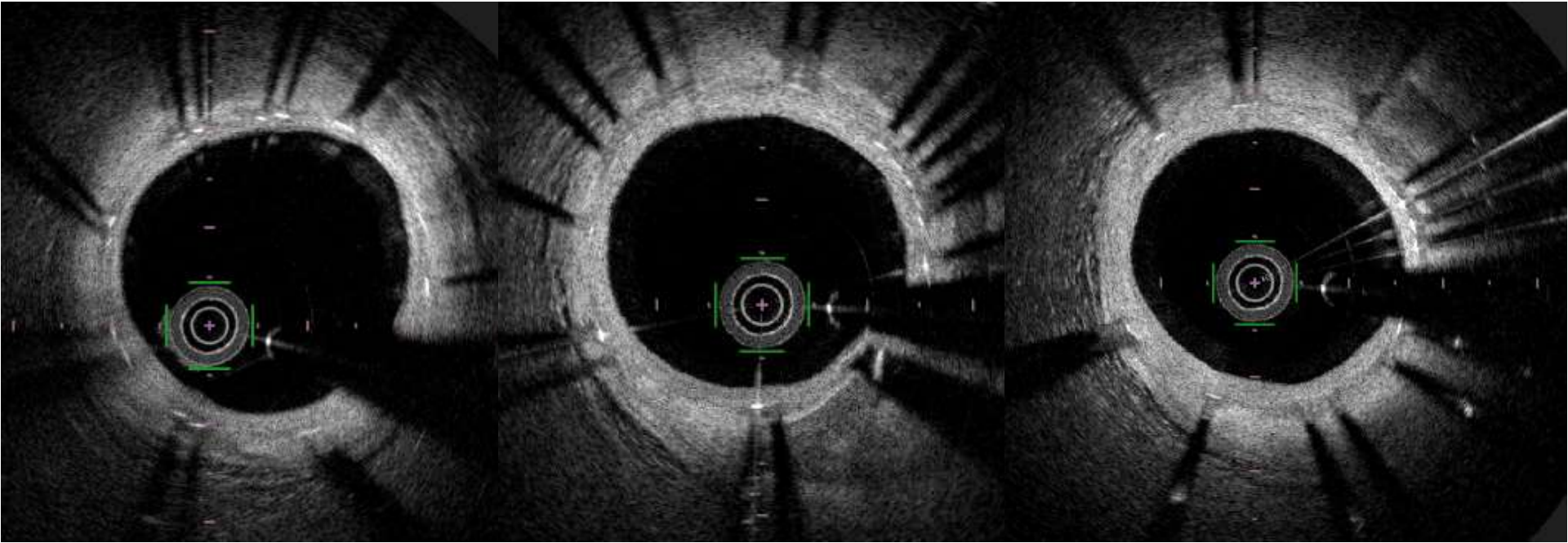


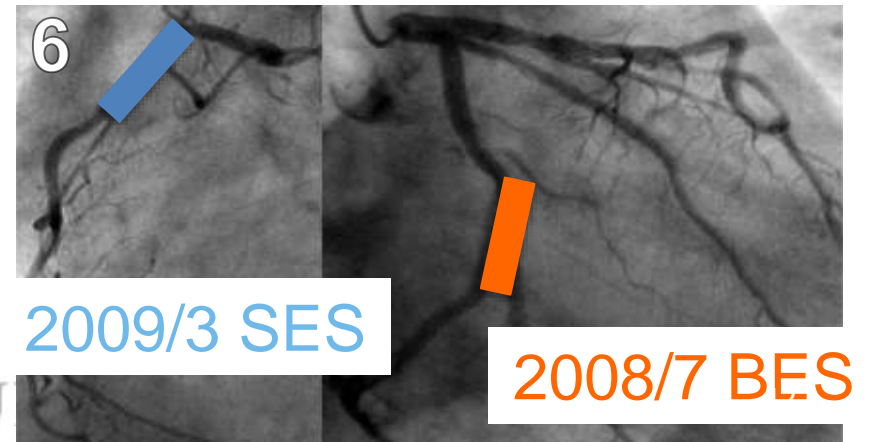
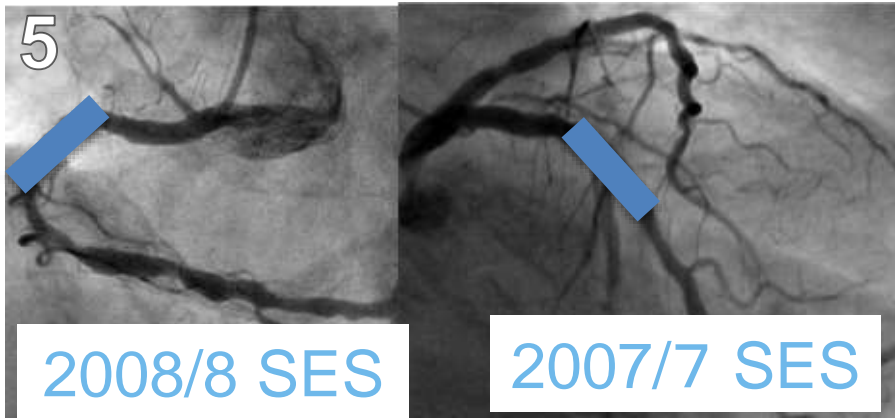
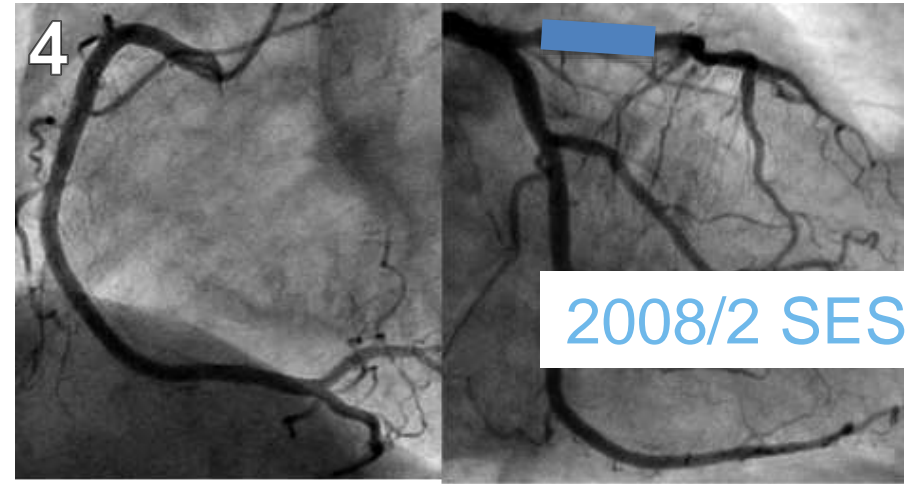
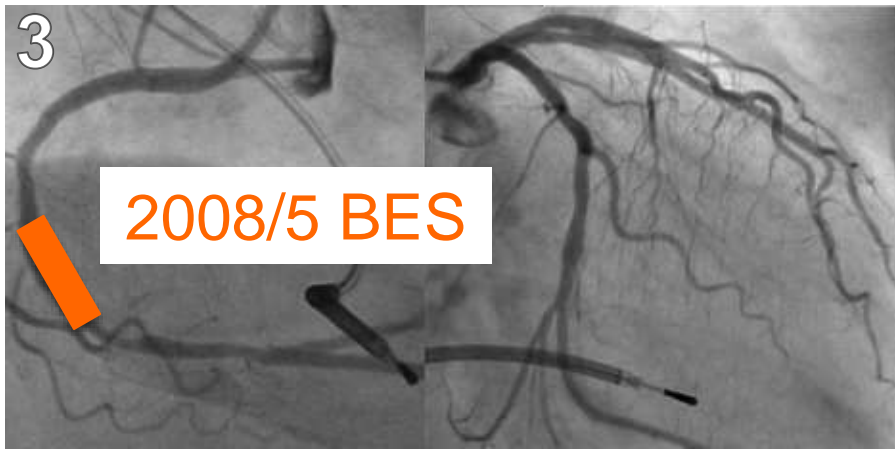
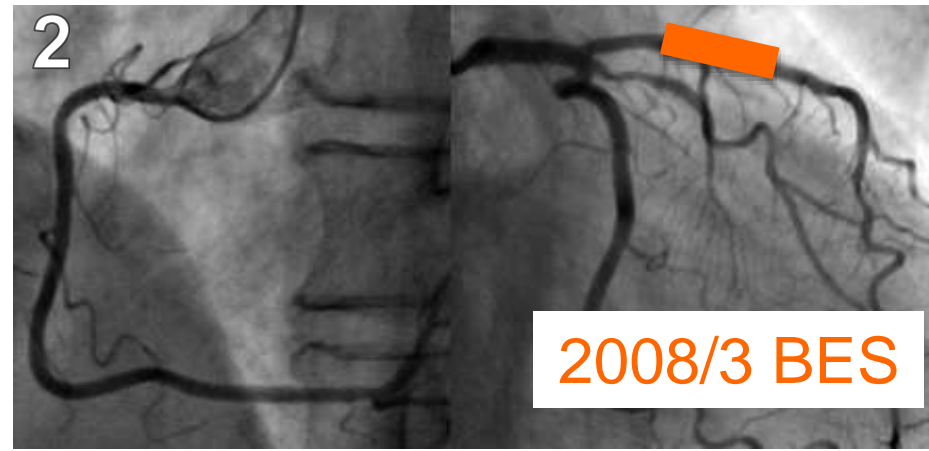
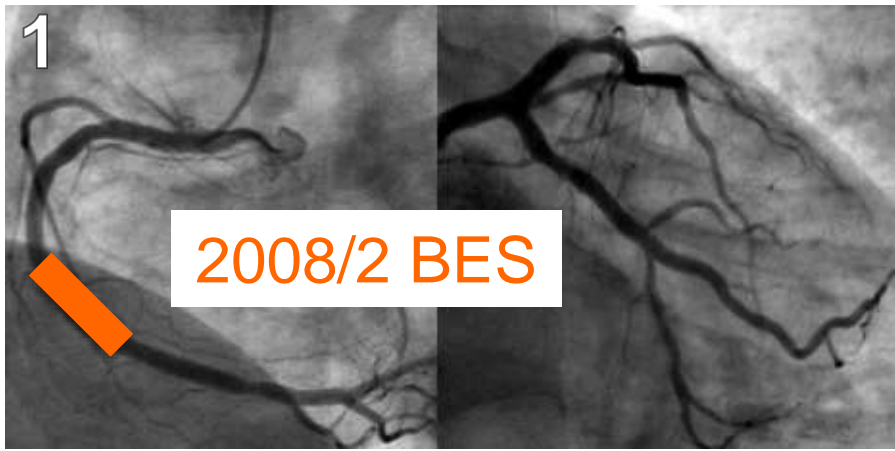
BP-Biolimus A9 Eluting Stents (Nobori/BioMatrix) 6-Year follow-up by OFDI



BP-Biolimus A9 Eluting Stents- 6-Year FU

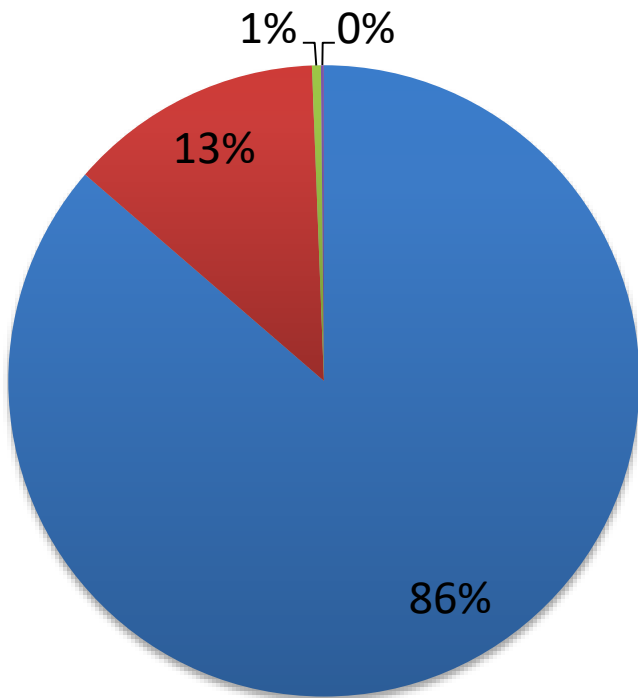
Uniform homogenous Neointima



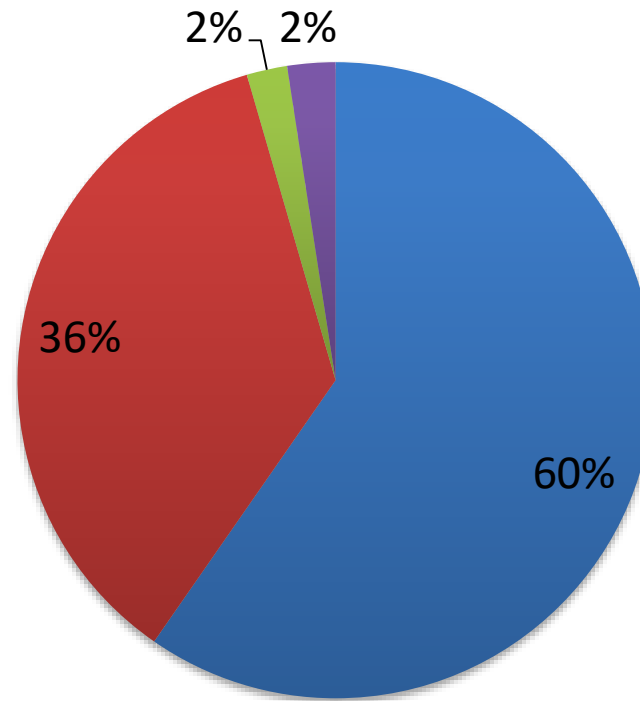


Strut Coverage

BP-BES (BioMatrix)



SES (Cypher)



- embedded
- thin covered
- uncovered
- malapposed

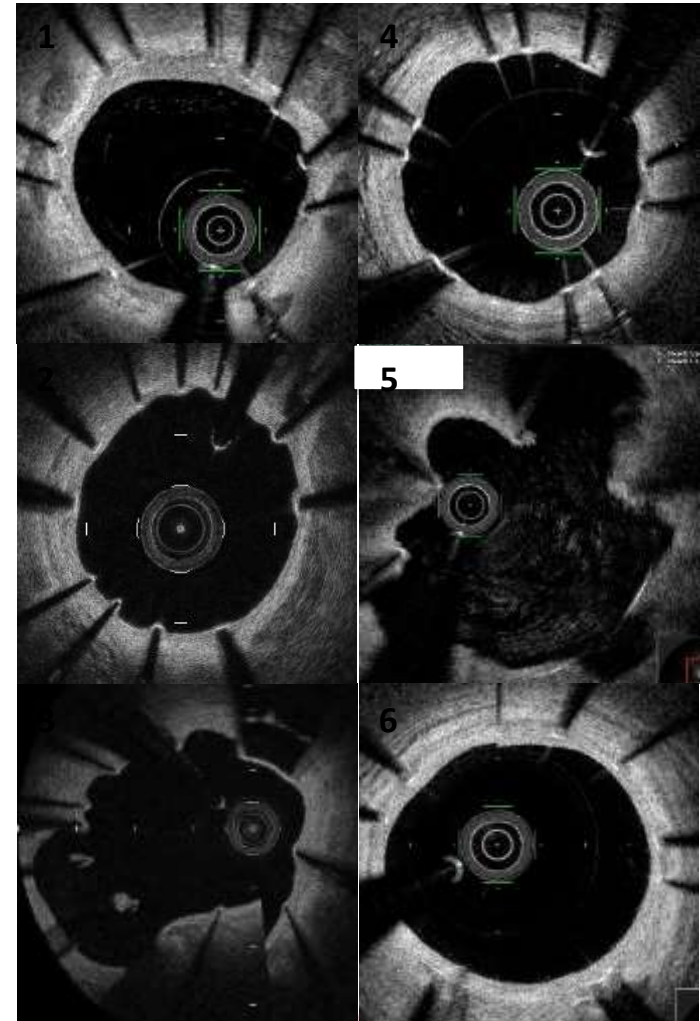
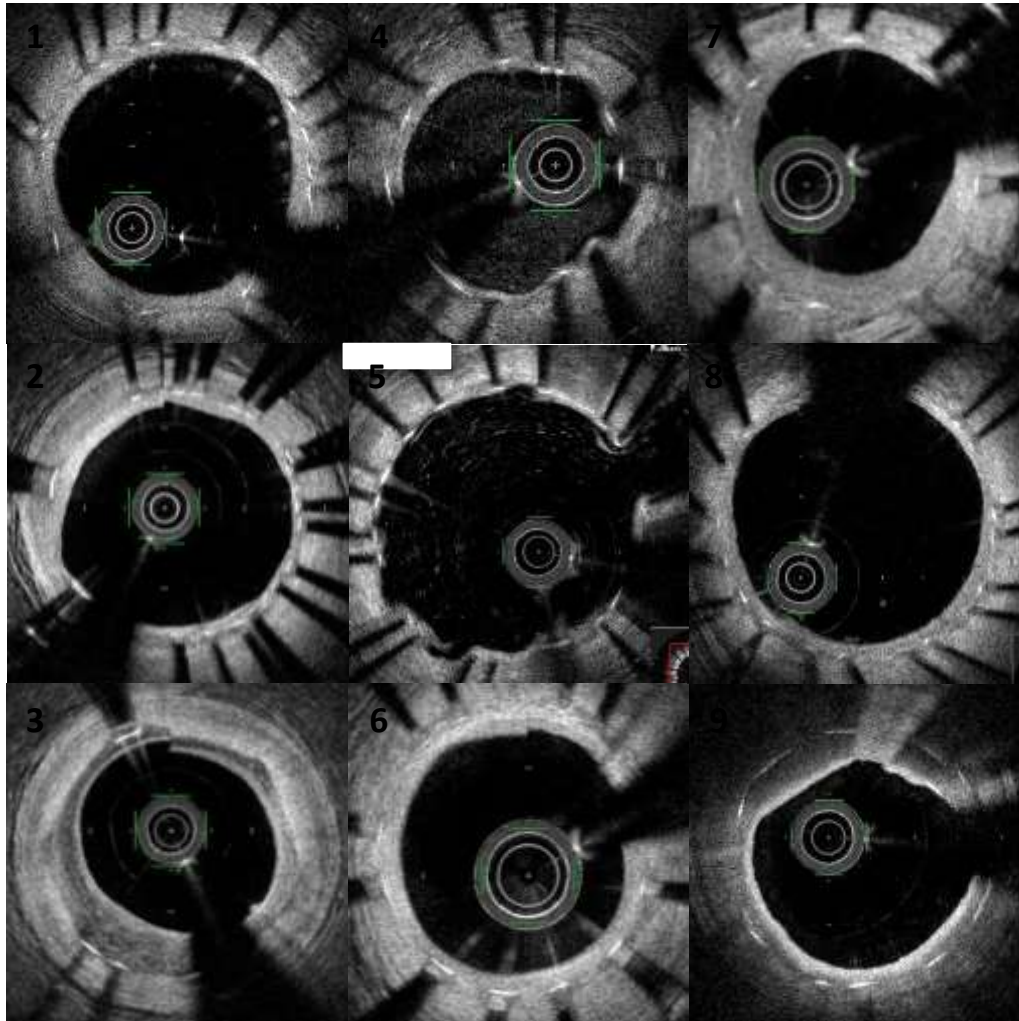
Torii S, et al. JCS 2015



OFDI images

Biolimus A9 n=9

Sirolimus n=6



Interventional Cardiology
International Center



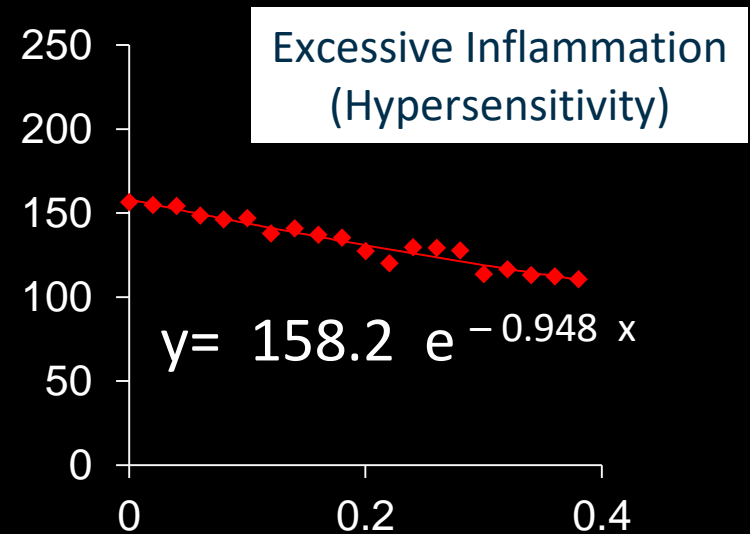
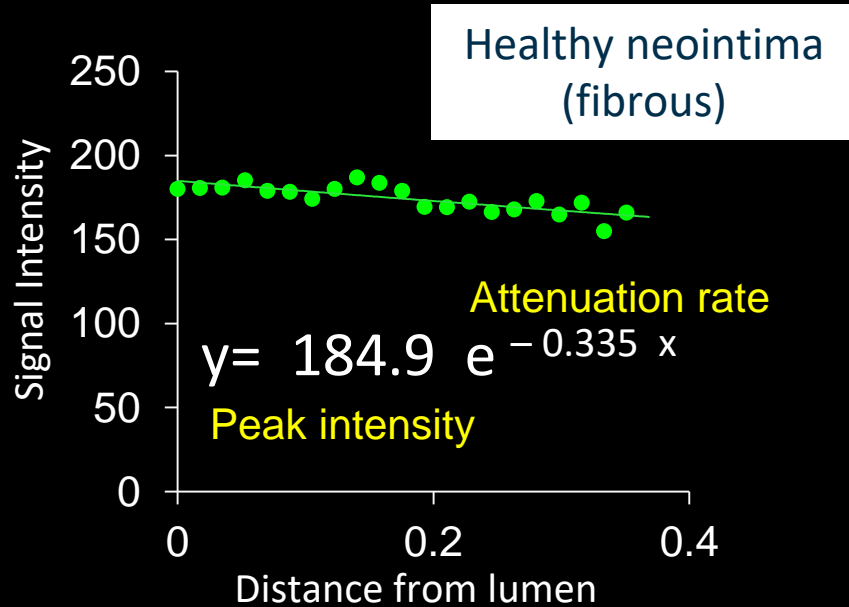
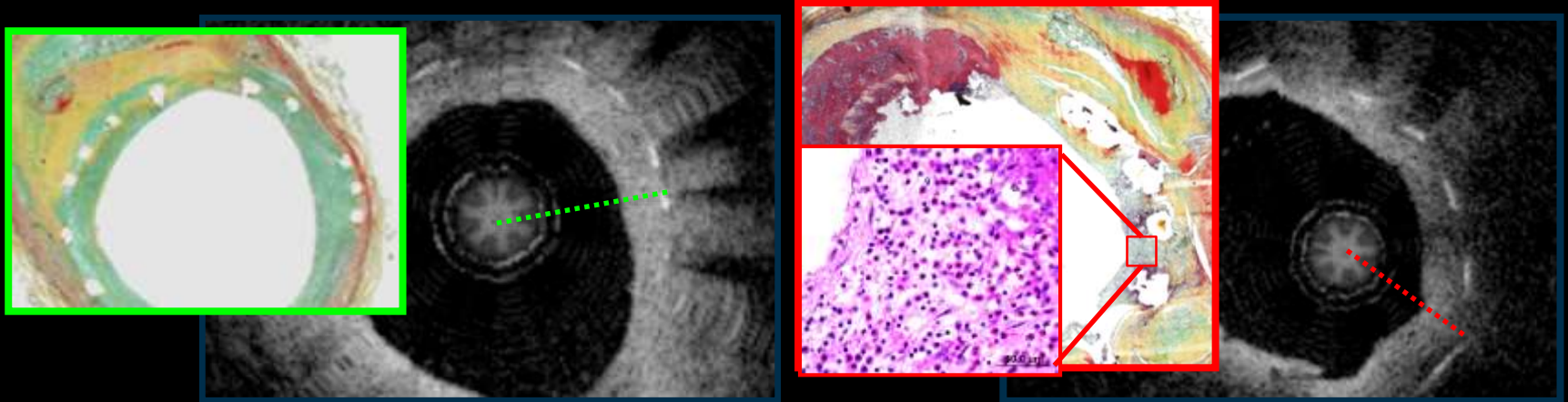
SUNRISE lab.



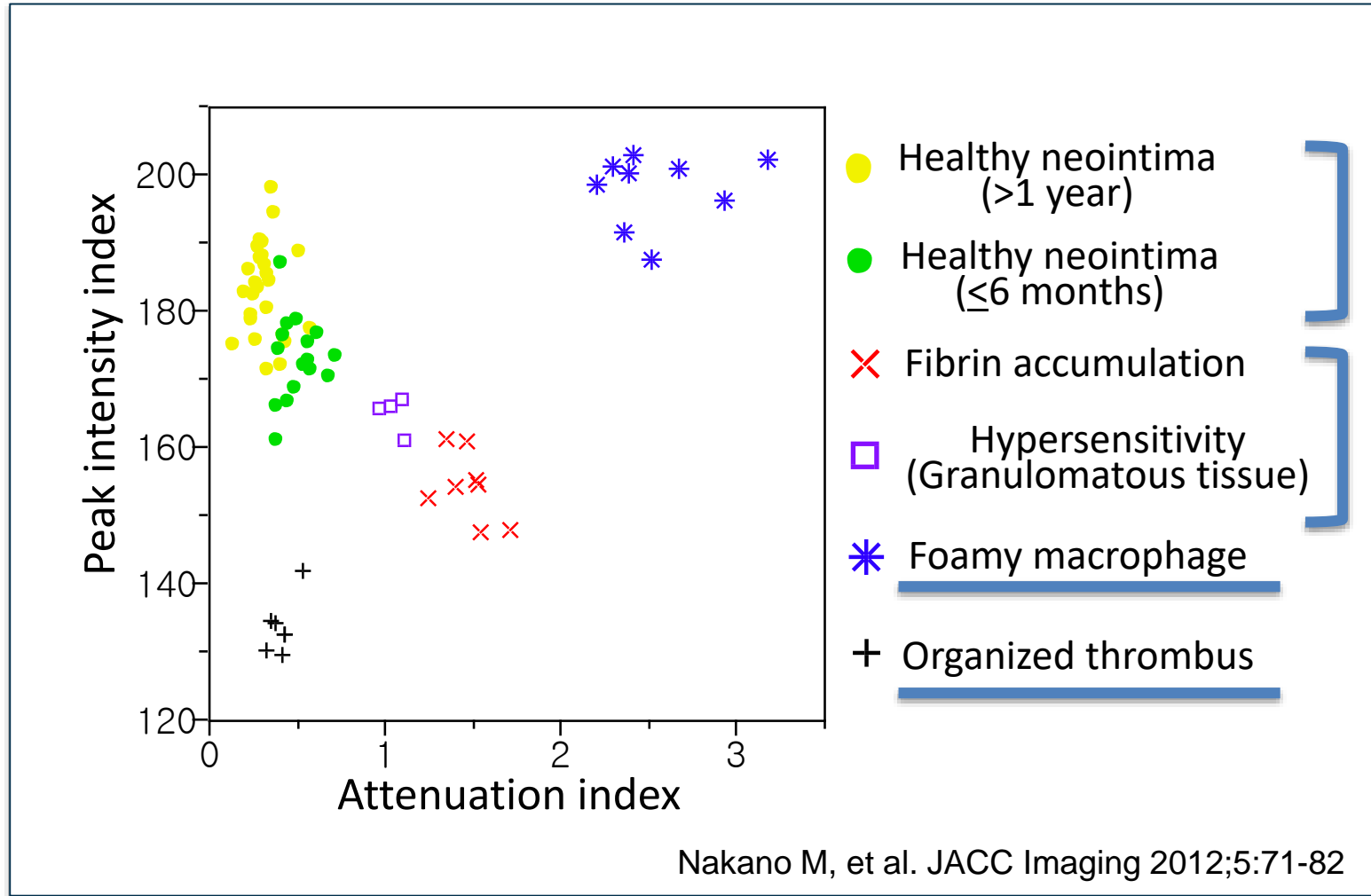
Torii S, et al. JCS 2015

Neointimal characterization

by ImageJ software

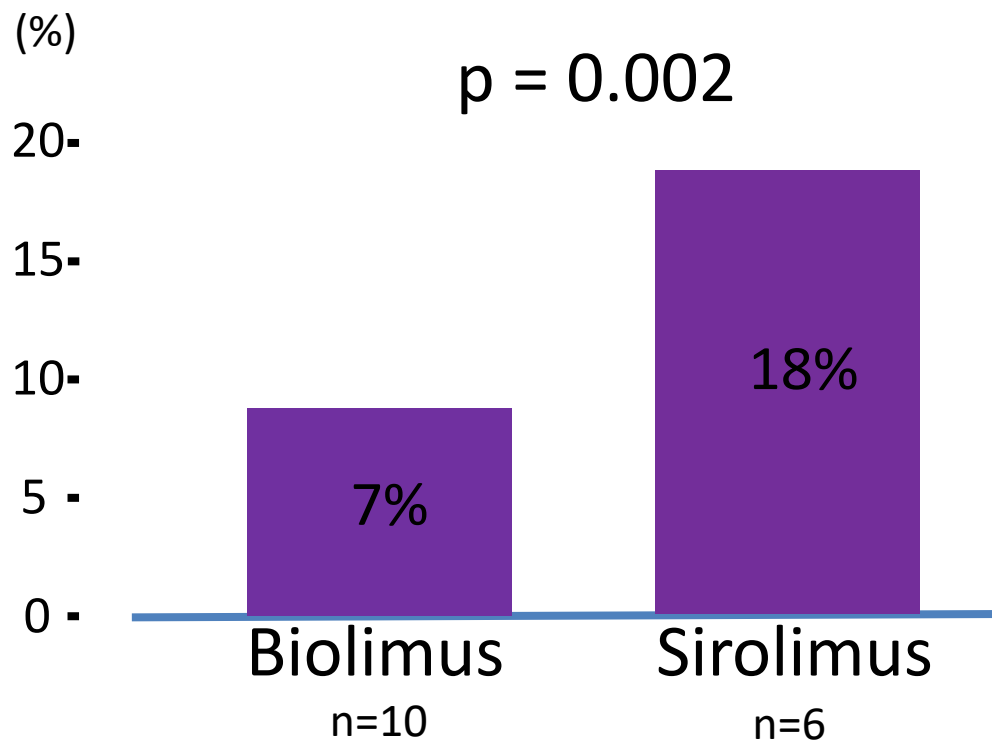


Signal Analysis of Neointimal Tissues



Qualitative Analysis

Percentage of Abnormal Neointima



Torii S, et al. JCS 2015



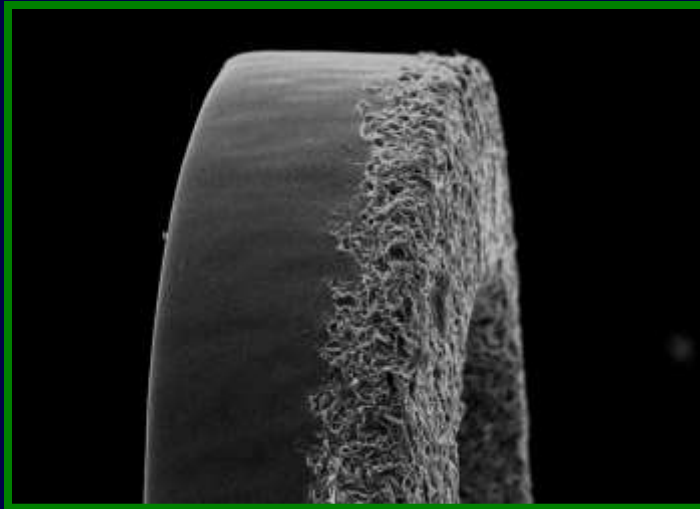
Long-term OCT study tells us...

- Safety of Biolimus A9 as a drug
- Degradation of polymer is important to ensure long-term biocompatibility

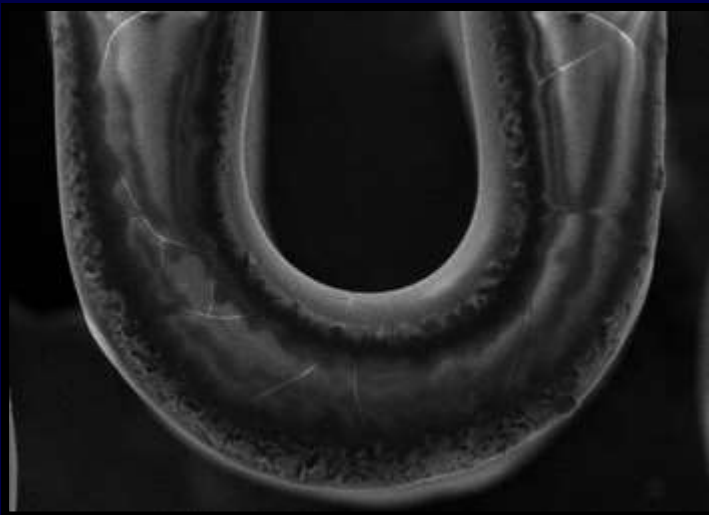


BioFreedom Stent

Biolimus A9[®] Drug

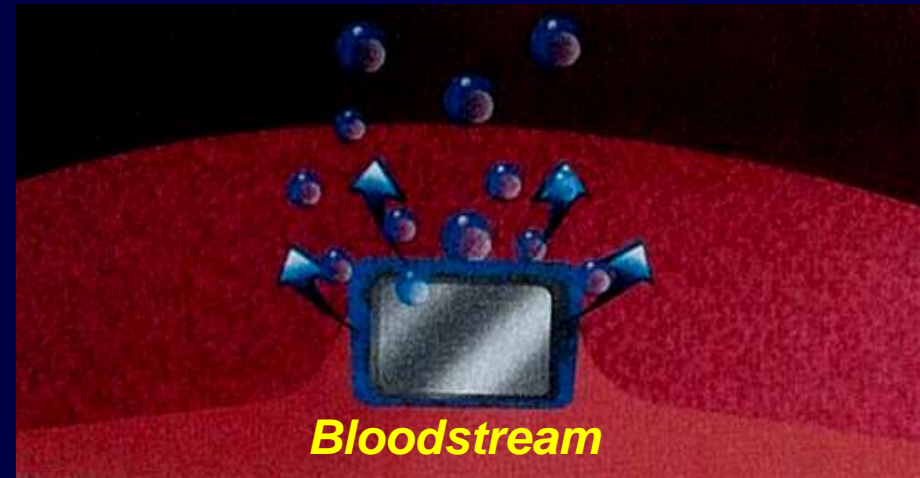


Selectively micro-structured
Surface holds drug in
abluminal surface structures

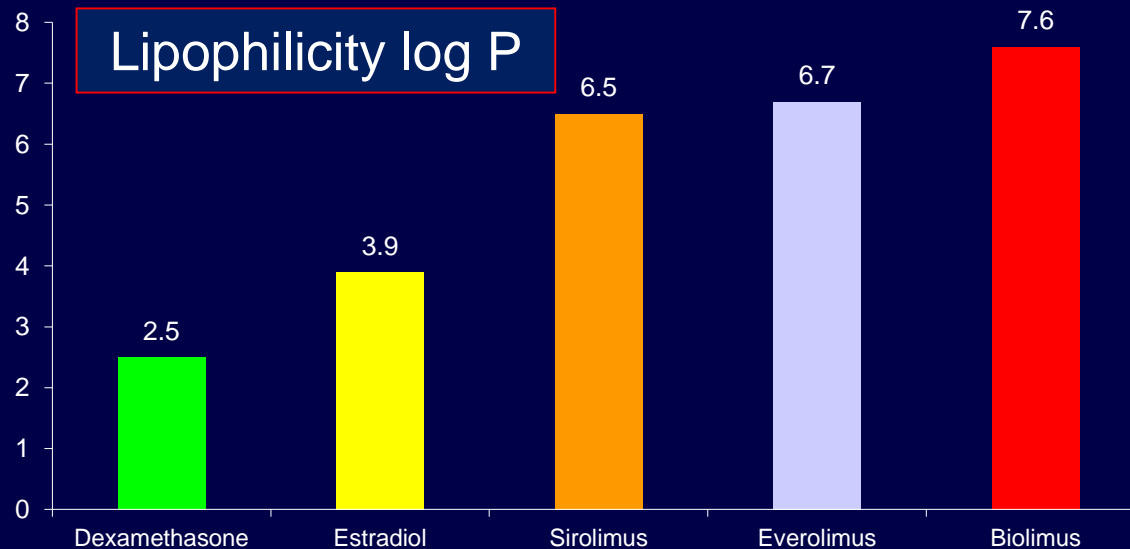
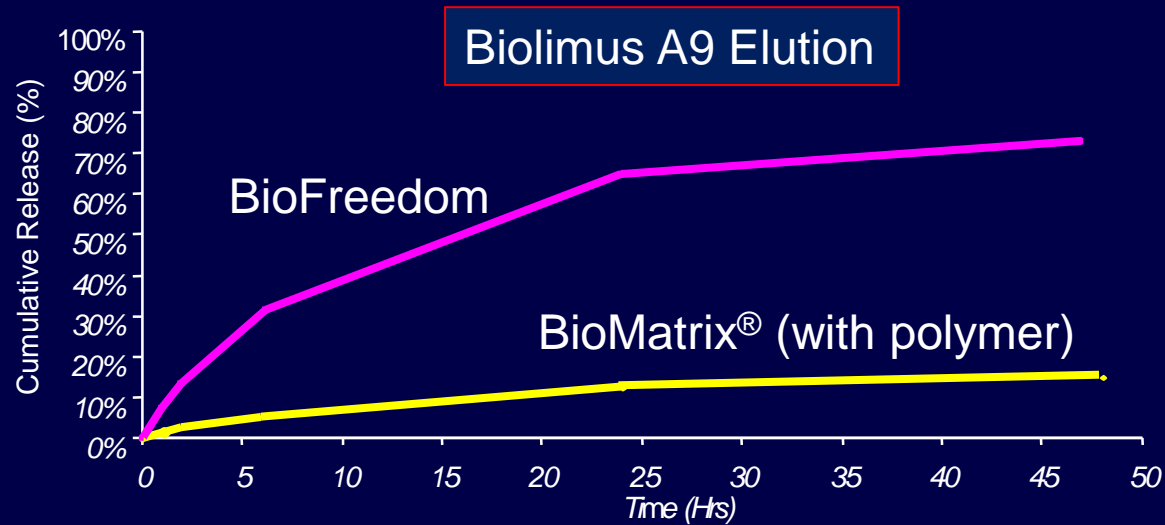


Pure Biolimus A9 impregnated
in metal stent surface

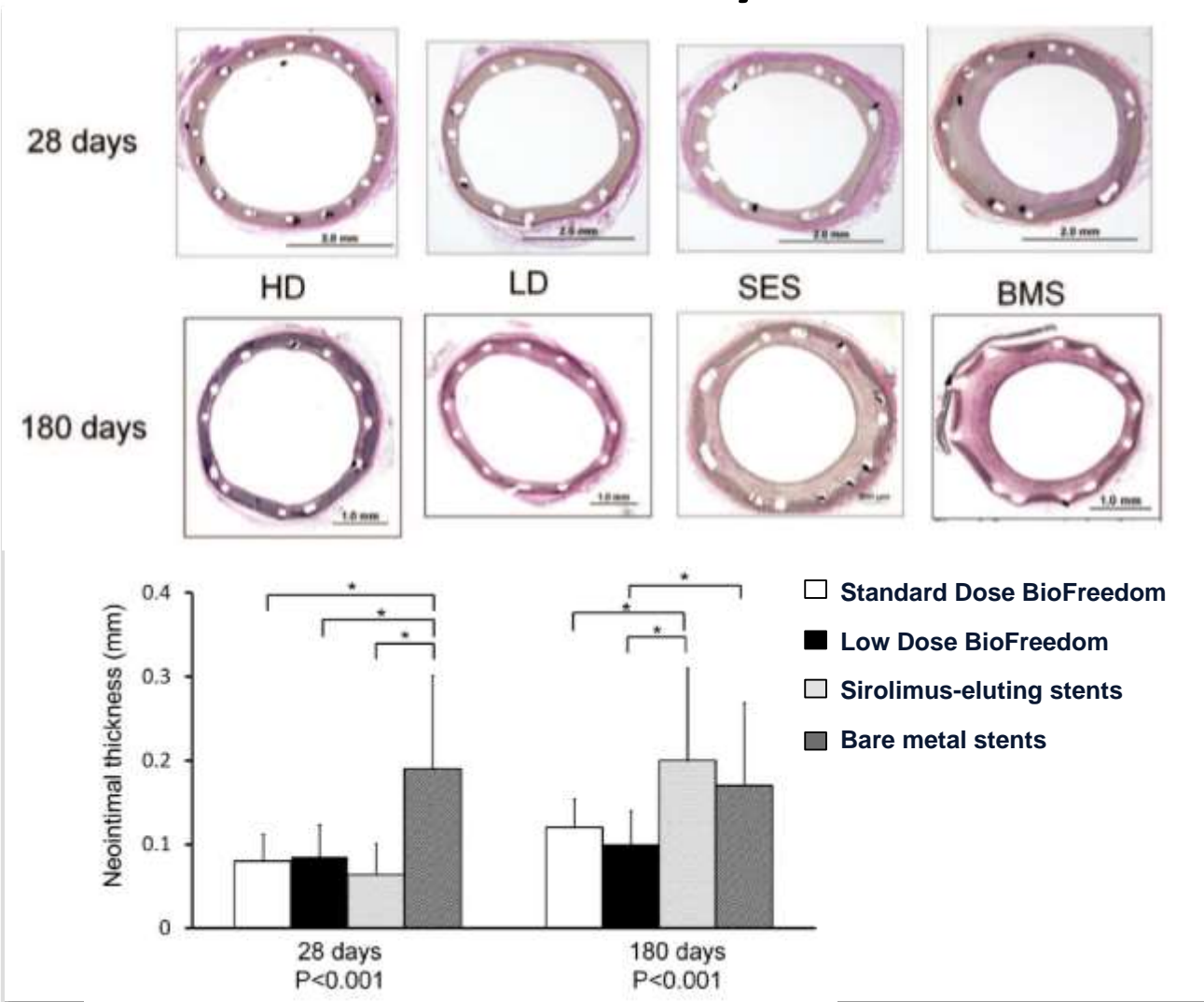
Abluminal drug coating targets
blood vessel walls. Small amounts
are released into circulation



Biolimus A9[®] Release and Lipophilicity



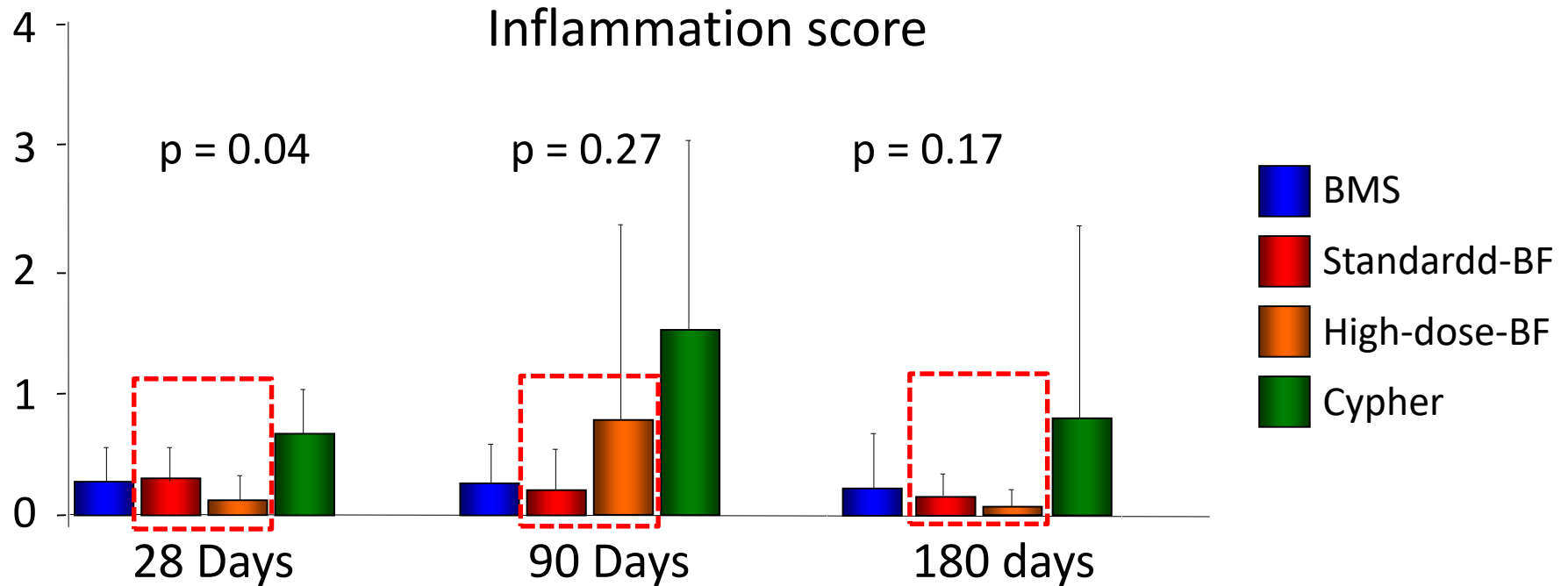
Pre-clinical Efficacy Evaluation



Tada et al., Circ Cardiovasc Interv 2010;3;174-183



Inflammation Score for Bio-Freedom Stents in the swine coronary arteries



Elution Kinetics for the Drug from the Stent

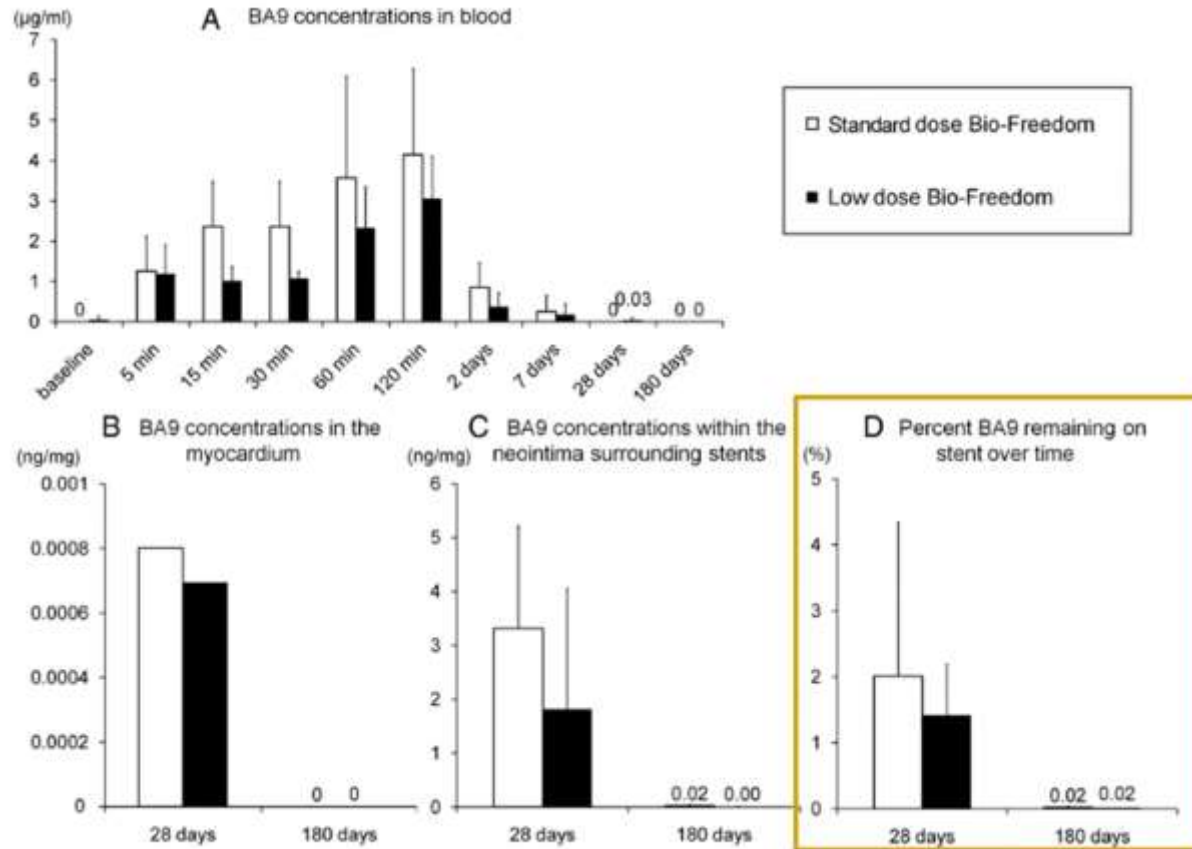


Figure 2. BA9 pharmacokinetics of SD and LD BioFreedom stent. The bars represent means \pm SD.

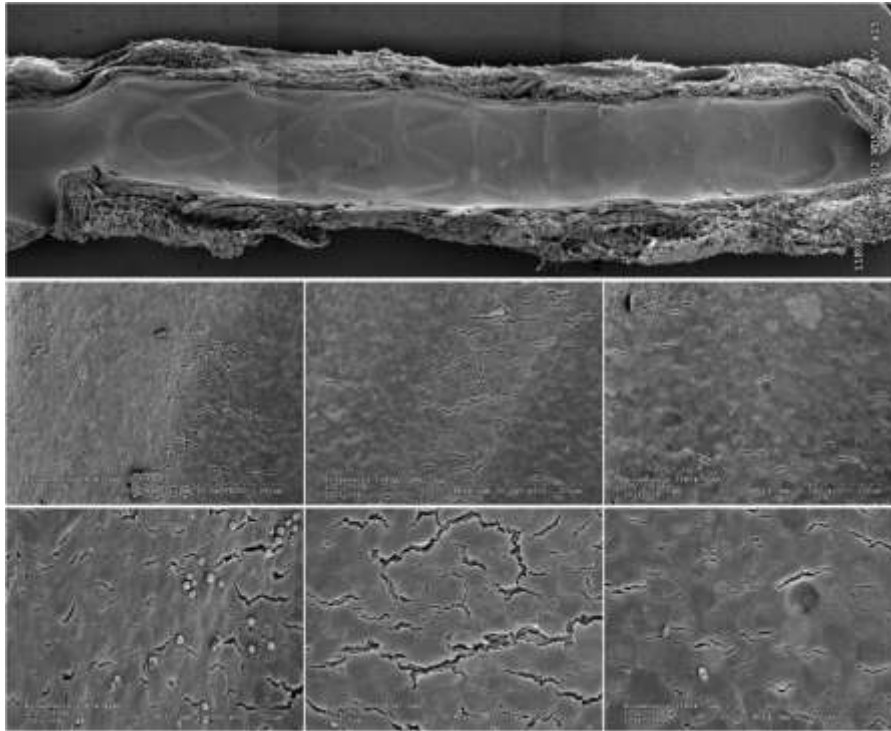
- 98% of the drug is eluted from the stent surface at 28 days.
- Comparably rapid initial elution profile
- Prolonged retention of BA-9 in the vessel wall which acts as a secondary reservoir, due to the unique high lipophilicity of the drug BA-9

Tada et al., Circ Cardiovasc Interv 2010;3;174-183

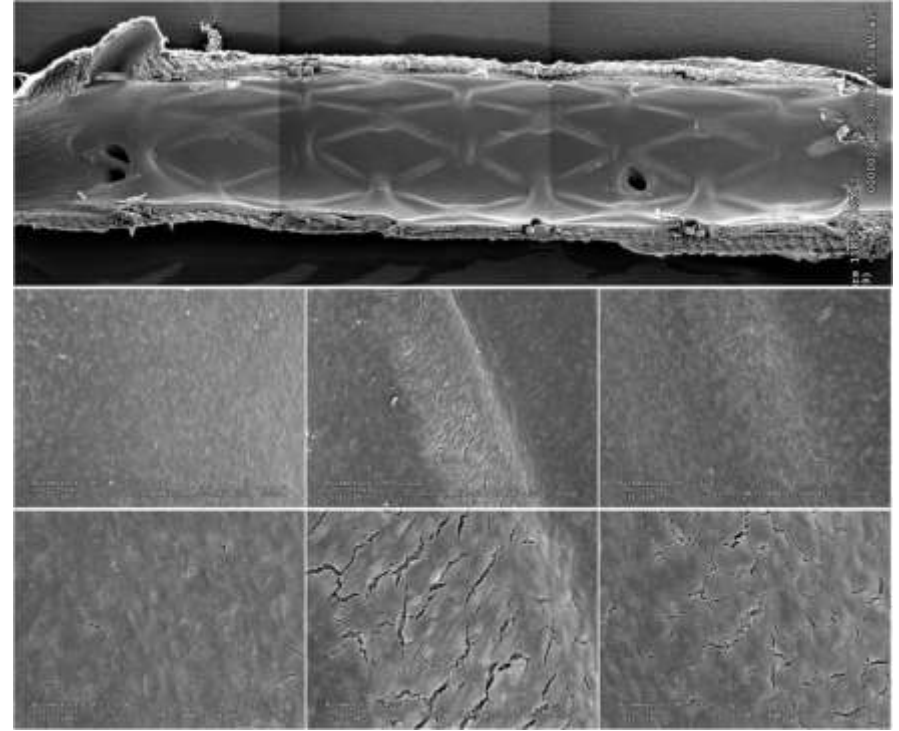


Re-endothelialization at 28-Day in Porcine model

**Biolimus A9 coated
BioFreedom Stent**



**Bare metal
Control Stent**



Full endothelium recovery equivalent to BMS at 28-Days



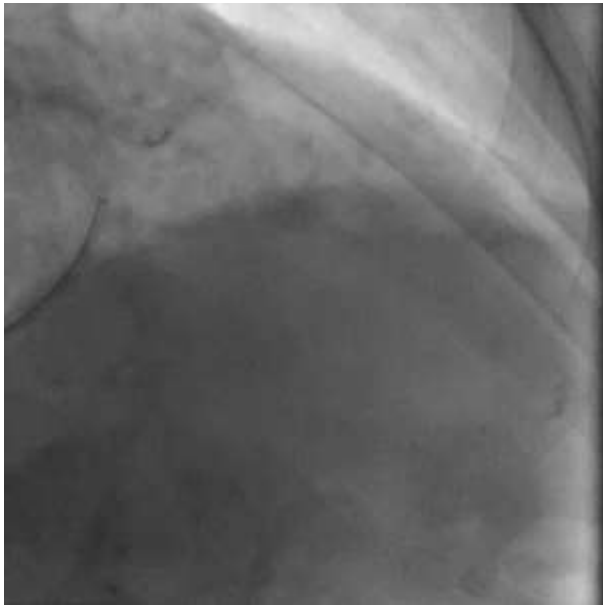
Biofreedom :

Do you think this stent has relatively
high “Late-Loss”?

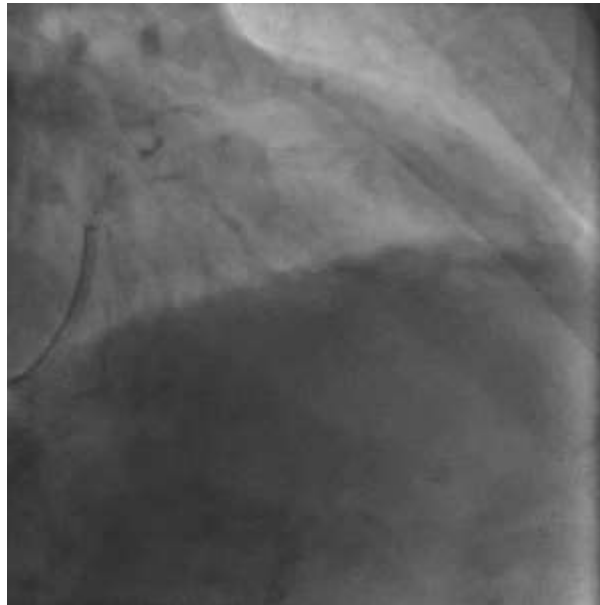


A Case of PCI with high bleeding risk

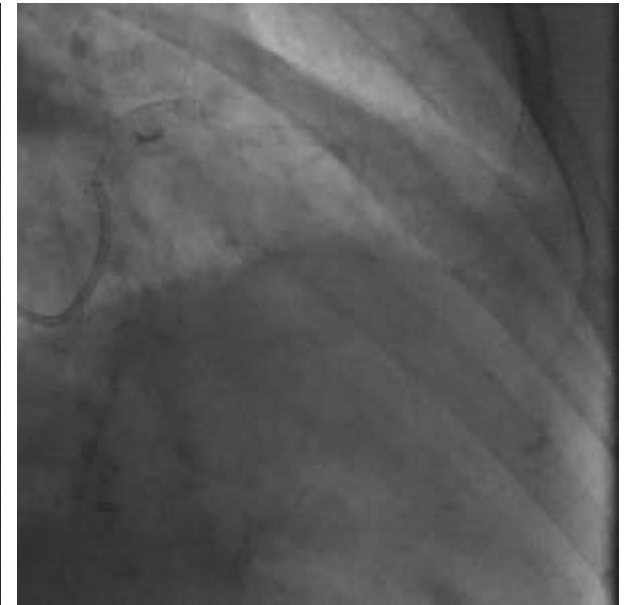
20140731 (Pre)



**20140731 (Post;
Rota+BF)**



20151022 (15m Fu)



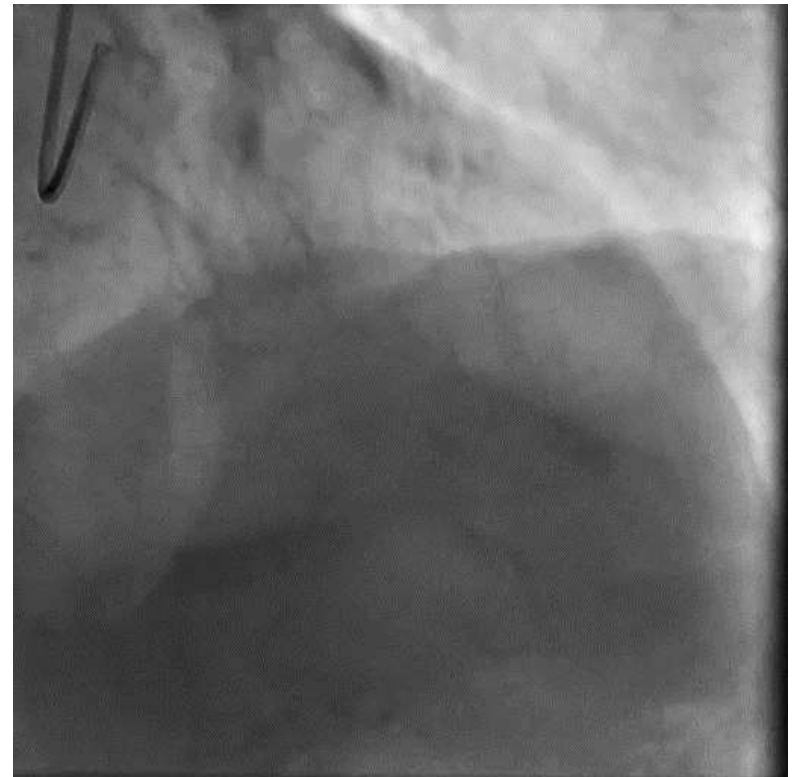
PCI to LAD

- A patient with planned vascular surgery

Pre PCI



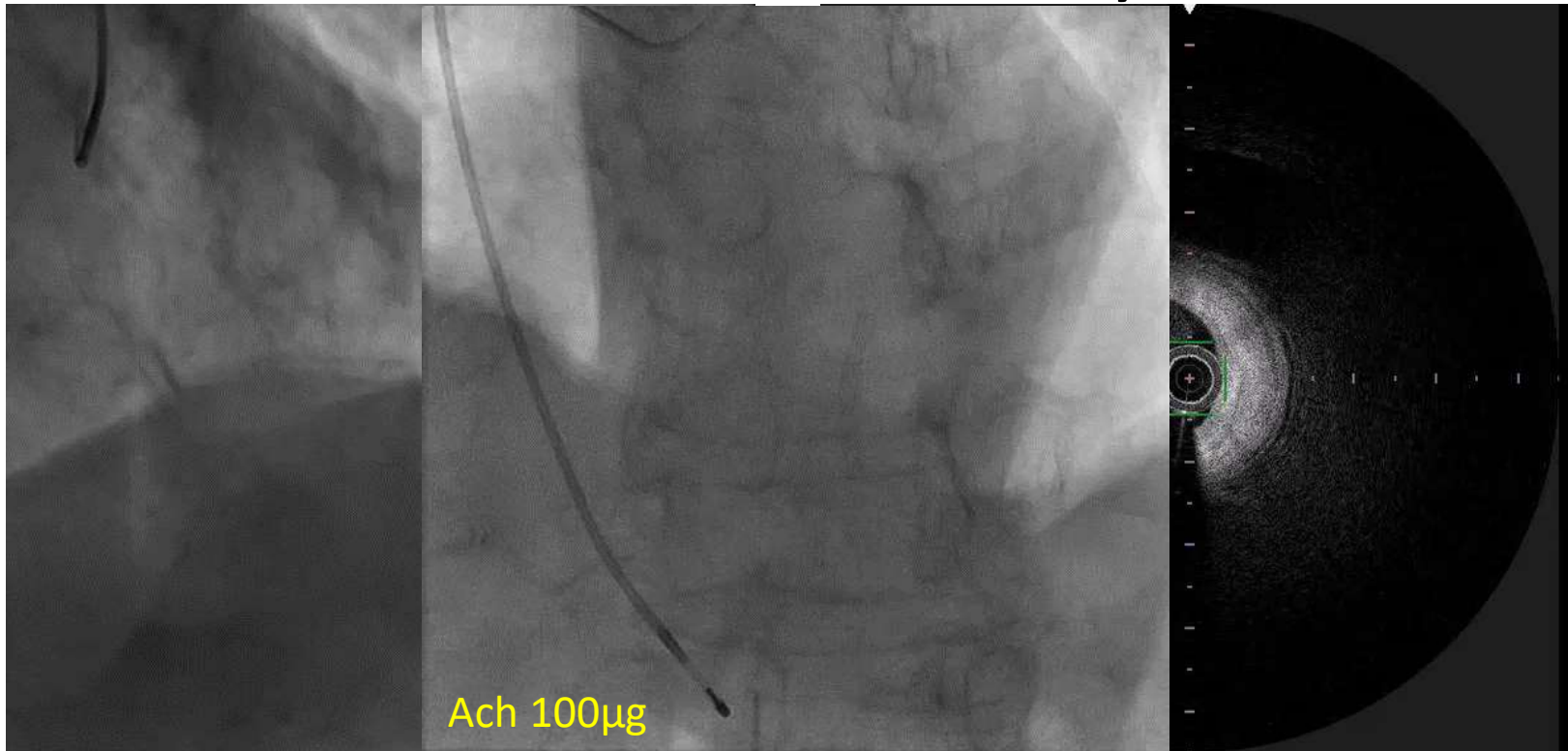
Post PCI



Follow-up: Because of chest pain

FU (2.5y)

OFDI @ 2.5y



Biofreedom : Biolimus A9 Coated Stent

- Biolimus A9 is a safe drug
- No polymer (either degraded or no polymer) is ideal for long-term biocompatibility
- Biofreedom stent can provide
 - Early healing
 - Good neointimal inhibition
 - Long-term safety

