Background Information on Clinical Data for the BioMatrix™ Stent Family

In addition to the LEADERS study [see separate backgrounder], the clinical studies completed or currently ongoing with the BioMatrix drug-eluting stent (DES) family are as follows:

STEALTH I

STEALTH is a multicenter study comparing BioMatrix™ with the Gazelle™ (S-Stent™) bare metal stent in 120 patients with single de novo native coronary artery lesions treated at two sites in Germany and one in Brazil. Eighty patients were randomized to the BioMatrix and forty to the Gazelle control stent. The primary endpoint was in-stent late loss at six months. Key secondary endpoints were MACE (death, MI or TLR) at 30 days, 6 months and 12 months and then yearly up to 5 years.¹

BioMatrix not only achieved the primary endpoint of non-inferiority for in-stent late loss at six months compared with Gazelle, but also demonstrated statistical superiority for both in-segment (0.09 ± 0.31 vs. 0.48 ± 0.43, p<0.001) and in-stent (0.19 ± .39 vs. 0.76 ± 0.45, p<0.001) late loss at 6 months.¹

This benefit was achieved without a significant increase in adverse safety outcomes assessed as MACE in the first 30 days (3.8% vs. 2.5%)¹, after one year (5.1% vs. 5.0%)², after 2 years (6.5% vs. 7.5%)³, after 3 years (9.2% vs. 7.5%)⁴, after 4 years (11% vs. 10.8%)⁵, and finally after 5 years (18.1% vs. 10.5%).⁶

BEACON I

BEACON I is a prospective, multi-center BioMatrix registry conducted in Asia involving 292 patients with de novo or restenotic native coronary artery lesions. The primary endpoint was TVR at six months. Key secondary endpoints were MACE (death, MI or TLR) at 30 days, 6 months and 12 months.⁷

Results showed a 2.1% TVR at six months, and 2.8% at a year. MACE at six months was 4.8%, and 6.5% at 12 months.⁷

The results from the BEACON I registry suggest that BioMatrix is safe and effective in diverse, non-selected patients undergoing percutaneous coronary intervention.⁷

BEACON II

BEACON II is a prospective, multi-center, observational BioMatrix registry conducted at 12 Asia Pacific sites and involving 497 patients. It was designed to evaluate how the “all-comers” LEADERS results compare to the daily clinical profile of an Asia-Pacific population. The study focused on a “real-world” patient population with no limitations on the number of treated lesions, vessels, lesion lengths or clinical indications (chronic stable angina vs. acute coronary syndromes).

The primary endpoint of the registry was MACE (cardiac death, Q-wave and non Q-wave myocardial infarction, or ischemia-driven Target Lesion Revascularization) at 12 months.

Results at 12 months showed a MACE rate of 4.5%⁸, at two years 7.0%⁸, and at three years 7.9%⁹.
Results of the BEACON II registry show that BioMatrix has an excellent safety profile up to three years when used in routine clinical practice in an Asian population.5

**e-BioMatrix**

The e-BioMatrix Registry is a prospective, multi-center, observational registry to assess the outcomes of over 5,000 "real-world" patients receiving BioMatrix Flex across 77 European study sites over a five-year period. It has been designed to assess the reproducibility of the long-term results from LEADERS, but in a broader range of centres.

e-BioMatrix consists of two different registries: e-BioMatrix PMS (Post-Marketing Surveillance), which enrolled 1,106 patients; and e-BioMatrix PMR (Post-Marketing Registry), which enrolled 4,453 patients. All patients in the PMS registry are being comprehensively monitored, including for baseline information, index hospitalization and the patient file until last reported cardiac-related event. The primary endpoint of the registry was MACE (a composite of cardiac death, MI and clinically-driven TVR) at 12 months. The PMS registry is also examining a range of secondary endpoints, including primary and secondary stent thrombosis over several periods; MACE at intervals up to five years; and death and MI rates for up to five years.

The protocol for the PMR registry is similar, except that it is monitoring for reported cardiac-related events only.

A broad range of inclusion criteria have ensured that e-BioMatrix is a "real-world" registry: patients just had to be a minimum of 18 years old and have been treated with one of the BioMatrix family of DES (any size, any vessel). Multiple stents were allowed. There were no limitations on the number of treated lesions, vessels, or lesion length.

The PMS registry solely involved patients given the original BioMatrix, whereas the PMR registry involved patients given both BioMatrix and BioMatrix Flex™.

One-year data pooled from both registries was reported at EuroPCR in May 2013.10 This involved 5327 patients, representing 96% of the original patient population. Only 239 (4.3%) were reported as experiencing a primary endpoint event. A very low rate of definite/probable stent thrombosis was observed (0.6%), with most incidences occurring in the first month, while low rates of major bleeding continued out to 12 months, with an incidence of 1.6%. This confirmed the excellent safety profile of the BioMatrix DES family in a real-world patient population.

Two subgroup analyses of e-BioMatrix were also presented at EuroPCR 2013:

**Patients with comorbidities**: as measured by the Charlson Comorbidities Index (CCI), a scoring system involving weighting factors on the basis of the disease severity and allowing quantification of comorbidities. The aim of the study was to assess whether comorbidities influence prognosis. Results showed that the efficacy of the BioMatrix stent family was not affected by comorbidities: comorbidities did not influence stent thrombosis rates; the efficacy and safety of the BioMatrix stent family was maintained in all patients, independently of accompanying comorbidities.11

**Diabetic patients**: who tend to have worse outcomes than non-diabetic patients following PCI, because of more advanced disease, different pathophysiology and associated comorbidities. The aim of the study was to assess the efficacy and safety of the BioMatrix family stent in a diabetic population. There were no differences shown in efficacy or safety between the diabetic and overall patient populations, with comparable rates of MACE and definite or probable stent thrombosis at 12 months.12
References