**Supplementary data**

## Supplementary Appendix 1. Inhomogeneity index of degradation per strut cross-section ($InI_D$).

The inhomogeneity index of degradation per strut cross-section ($InI_D$) was defined as a quantitative unitless measure based on the planimetry data that is sensitive to the shape of the undegraded area $A_{undeg}$ within the initial area $A_{ini}$ of an individual strut cross-section, while being independent of the degradation degree and of the aspect ratio of the strut cross-section side lengths which can vary by strut design and by cutting angle. Ideally, uniform shapes of $A_{undeg}$ with equal degraded layer thickness at all four sides result in $InI_D = 1$, whereas non-uniform shapes of $A_{undeg}$ with a minimal width or height within the shape result in $InI_D > 1$ **(Supplementary Figure 2)**. Certain irregular shapes of $A_{undeg}$ (e.g. trapezial) can lead to $InI_D < 1$. Since the frequency of such strut-cross sections could differ between scaffold type groups, strut cross-sections with $InI_D < 0.85$ are excluded from evaluation to avoid unequal effects on the group mean values of $InI_D$, while still allowing a certain scattering around 1.00.

The formula used to determine the inhomogeneity index of each strut is

$$InI_D = \frac{100\% - \text{'minimum degree of undegraded distance'}^2}{\text{'degradation degree of strut cross-section normalized to square-shaped } A_{ini}\text{'}}$$

$$InI_D = \frac{100\% - \left(\frac{D_{min,undeg}}{D_{ini}}\right)^2}{100\% - \frac{A_{undeg} + 0.5\left(\Delta_r^2 - \Delta_r\sqrt{\Delta_r^2 + 4A_{undeg}}\right)}{(r\,A_{ini})}}$$

With the following measures taken from planimetry (Supplemental figure2)

$\Delta_r$ = side length difference (long – short) from measured strut cross-section

$r$ = side aspect ratio (short/long) from measured strut cross-section

$D_{min,undeg}$ = minimal width or height (approx. parallel to sides of $A_{ini}$) within $A_{undeg}$ through the mass center of $A_{undeg}$

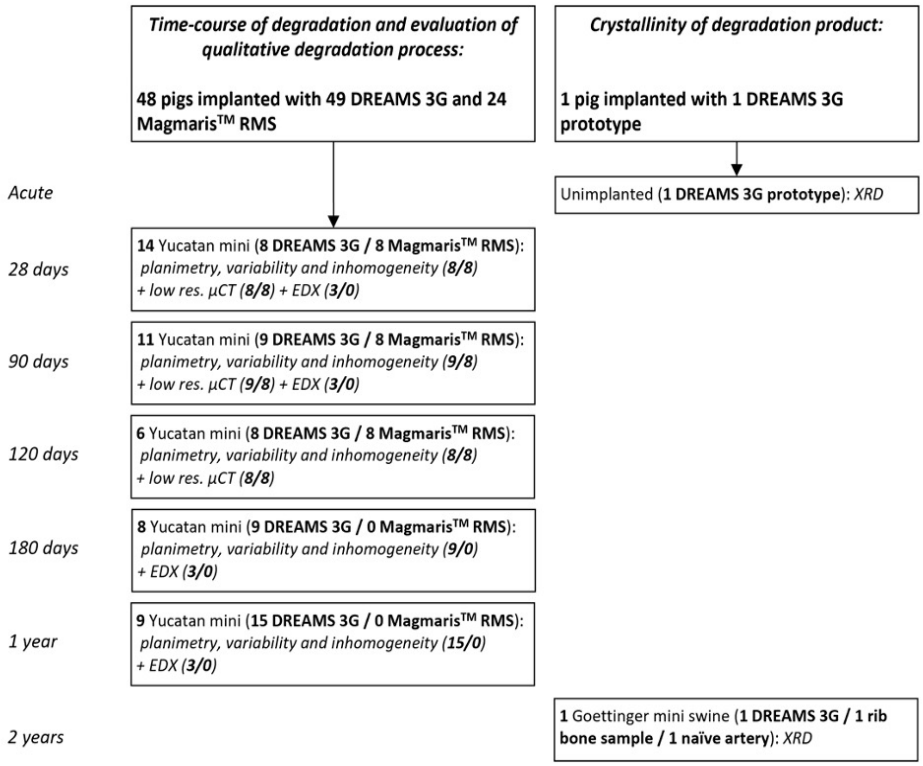
$D_{ini}$ = diameter of initial strut cross-section (without coating) in the main direction of $D_{min,undeg}$ (parallel to strut thickness or width)

The independence of the degradation degree was realized by squaring the minimum degree of undegraded distance. Thus, a non-uniform shape of $A_{undeg}$ with smaller scale, thus having a higher degradation degree, results in the same $InI_D$ value as the bigger scaled $A_{undeg}$ with same shape and lower degradation degree. The independence of the aspect ratio *r* was realized by normalization of degradation degree to square-shaped $A_{ini}$ (replacement of $A_{undeg}$ /$A_{ini}$ by fraction including the rescaling terms with $\Delta_r$ and *r*).

**Supplementary Table 1. Comparison of scaffold design and features.**

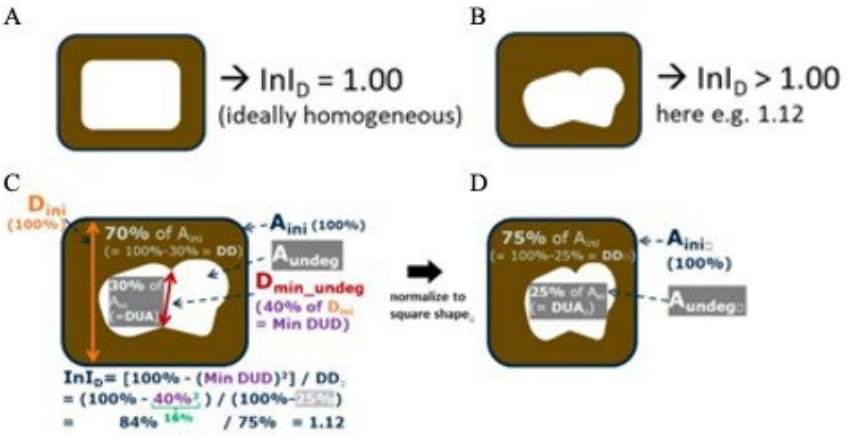
| | DREAMS 3G | Magmaris™ scaffold |
|---|---|---|
| Backbone alloy | BIOmag™ alloy: 93.75 wt% magnesium plus 6.25 wt% aluminum | WE43 based alloy: 93 wt% magnesium plus 7 wt% rare earth elements* |
| Coated polymer and the eluting drug | BIOlute™ coating: drug-eluting coating on the scaffold is composed of a bioresorbable poly-L-lactic acid (PLLA) polymer matrix loaded with sirolimus (140 µg/cm$^2$). | |
| Scaffold geometry | Six-crown and two-link design | |
| Strut thickness | 99 / 117 /147 µm | 150 µm |
| Crossing profile | 1.3 mm (for 2.5 - 3.5 mm size)<br>1.4 mm (for 4.0 mm size) | 1.5 mm |

* from reference [11]




**Supplementary Figure 1**. Study flowchart.

Number of animals, total devices per group and devices assigned to specific analysis methods.



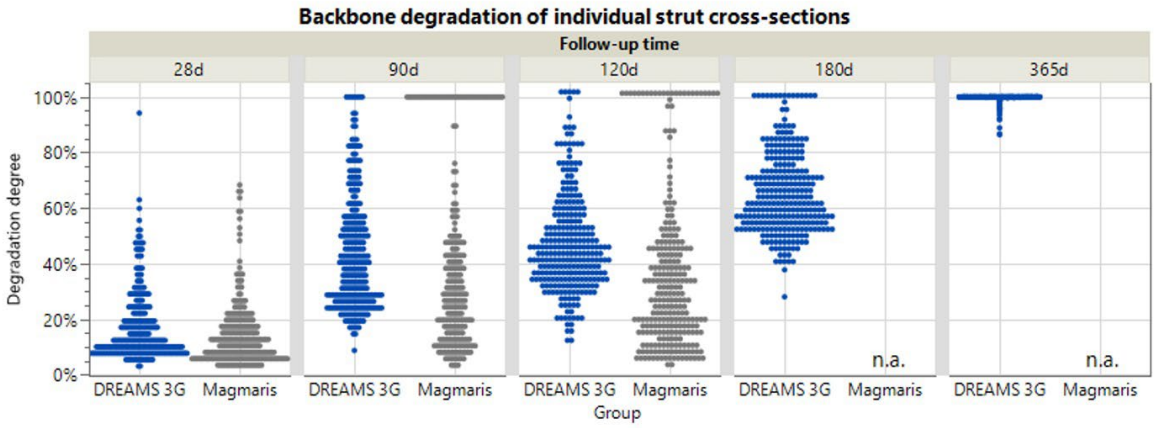

**Supplementary Figure 2**. Illustration of inhomogeneity index determination.

(A) Schematical illustration of ideal homogenous degrading strut cross-section with InID=1.00 and (B) an example of more inhomogeneous degrading strut cross-section with InID=1.12.

(C, D) Schematic illustration of inhomogeneous degrading strut cross-section including the measures extracted from partial areas Aundeg and Aini that were used in the formula for the inhomogeneity index, in this example leading to InID=1.12.

Used abbreviations (besides the ones defined in the text): DD = degradation degree; DUA = degree of undegraded area; Min DUD = Minimum degree of undegraded distance; DD□ and

DUA□ = same meanings, but after normalization to square-shaped strut cross-section.




**Supplementary Figure 3**. Scatter plot of backbone degradation of individual strut cross-sections per follow-up timepoint and device group determined by optical microscopy planimetry as visualisation of the variability per strut cross-section.

n.a.: not available