Supplementary information.

Fig S1 – Size and shape distribution of the crystallographic holes (different approaches)

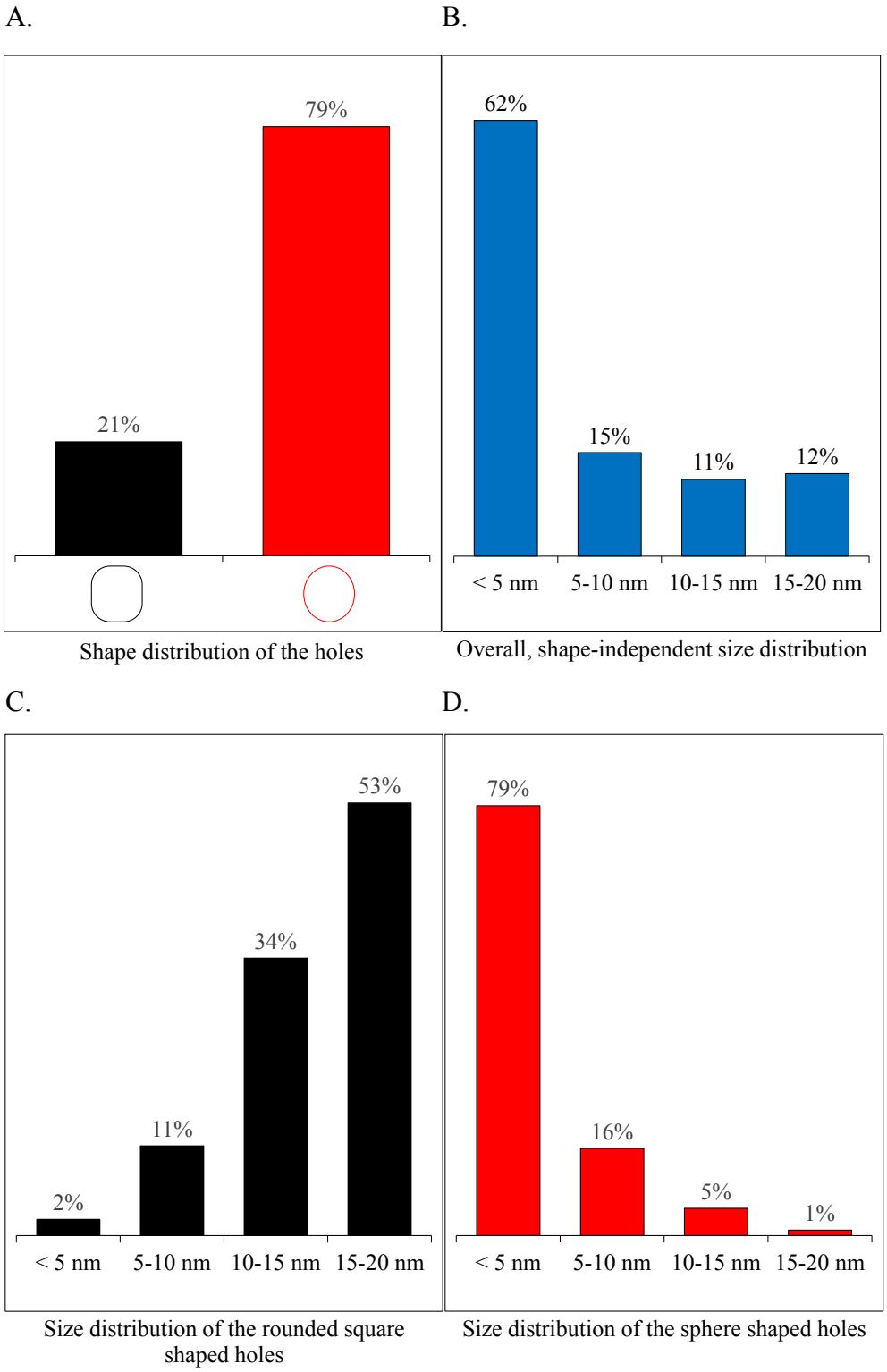
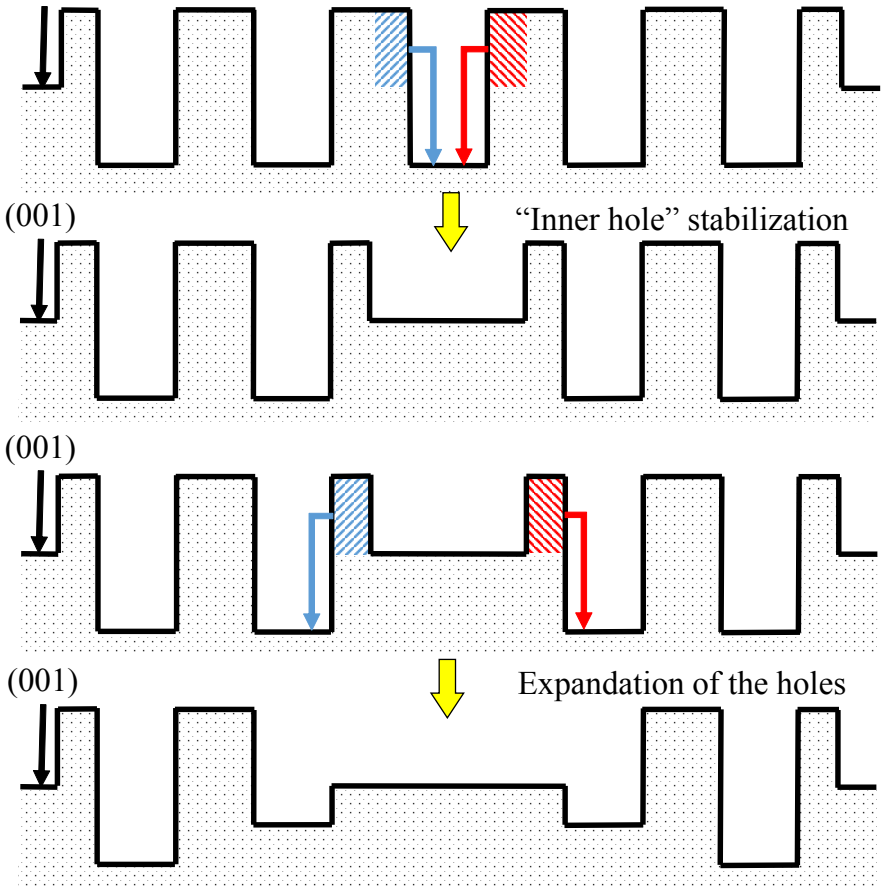


Fig S1 itself suggests, that the majority of the holes are spherical (Fig. S1A), which was indeed confirmed by the TEM micrographs provided in the main article. Interestingly, the overall size-

distribution (Fig. S1B, without taking in count the shape), shows, that smaller holes (below 5 nm) are dominating the nanoplates. However, as the holes are growing larger, their shape will be most probable squares, with rounded edges, which was clearly demonstrated by Fig S1C, D. Furthermore, these statistics show that the square shaped holes are mostly the larger ones, while at smaller size they were more likely spherical.

Fig S2 – The proposed mechanism of the hole expandation



As already stated in the main text and in the supplementary information, the holes showed different size distribution (Fig. S1). To explain this a surface with identical holes was considered. If the number of the adjacent holes is too high, than the border between the individual holes will present an extremely high number of defects. Consequently, a recrystallization process will be initiated in two steps. The first one is a material transfer process, which reduces somewhat the depth of the holes (inner-hole stabilization). The second one is a further material transfer process, which ensures that the hole in the center of the particle is merged with two vicinal holes, resulting a larger crystallographic entity. The proposed mechanism explains the fact that the majority of the larger holes are situated at the centre of the {001} facets, while the growth directions are the ones proposed in the main text.