

1.

Table S1: Patients' age, sex and clinical diagnosis

Patients	Age	Sex	Clinical diagnosis
OA 1	57	male	total knee replacement surgery
OA 2	62	female	total knee replacement surgery
OA 3	65	female	total knee replacement surgery
OA 4	63	male	total knee replacement surgery
OA 5	68	male	total knee replacement surgery

2.

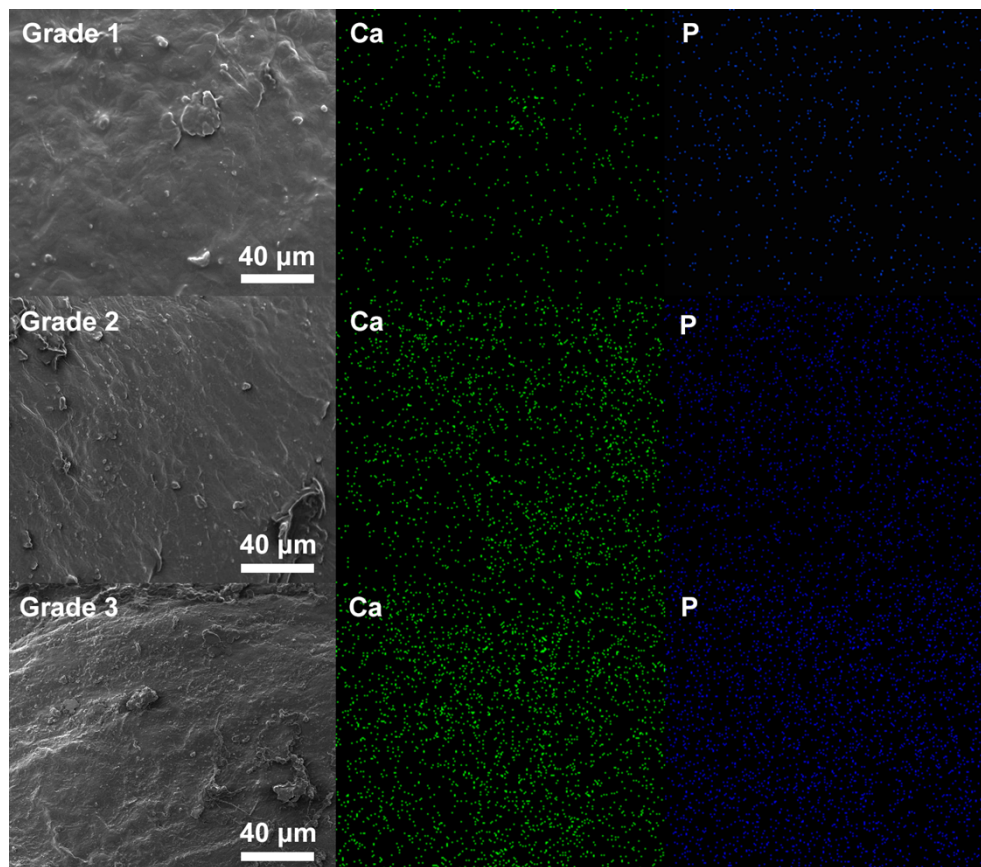


Figure S1: Typical SEM image and the distribution of Ca and P element in AC section at different stages of OA (Grade 1-3).

3.

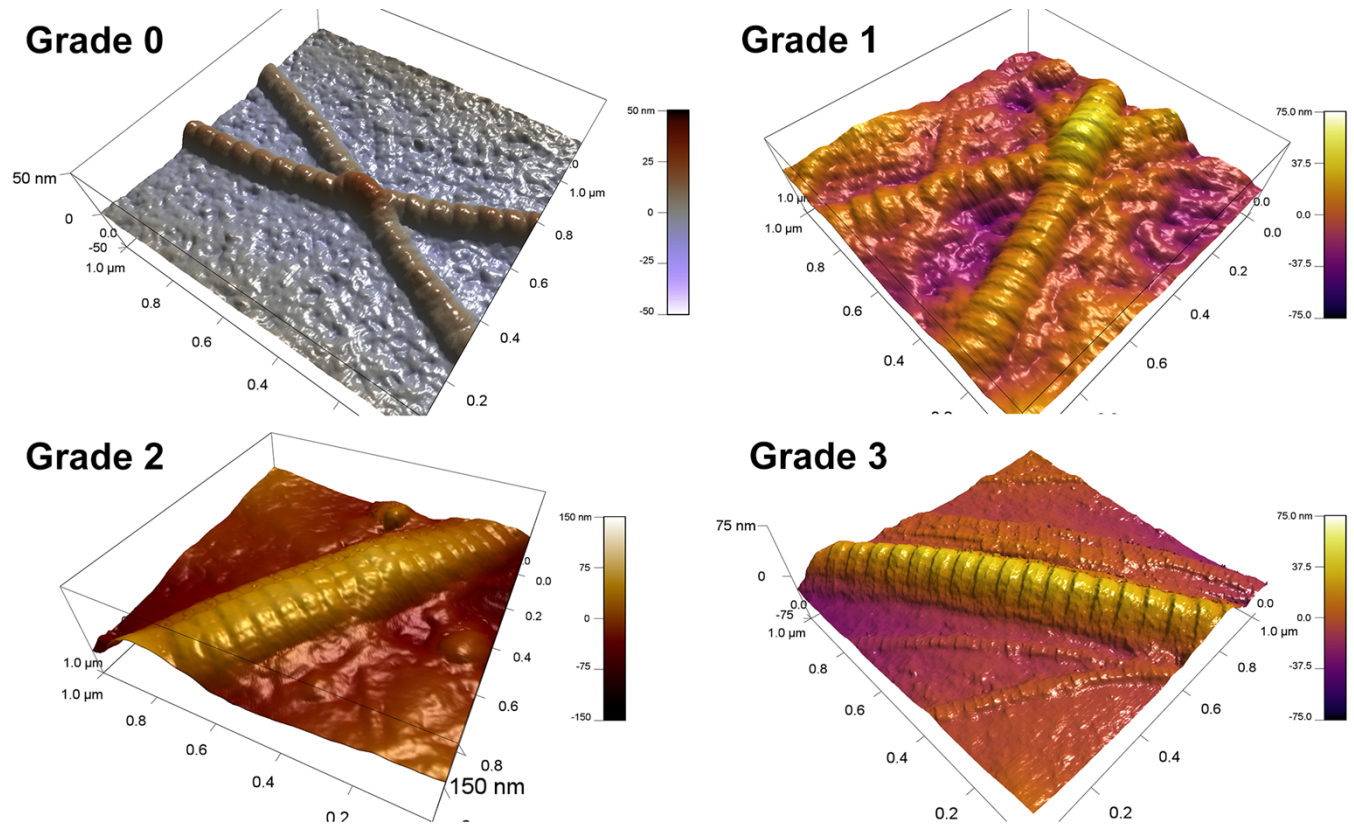


Figure S2: Typical 3D AFM image of individual collagen fibrils extracted from AC section at different stages of OA (Grade 0-3).