

Figure S41. Focused ion beam images of secretory stage enamel forming at Level 2 (mid-lateral) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S41 through S45).

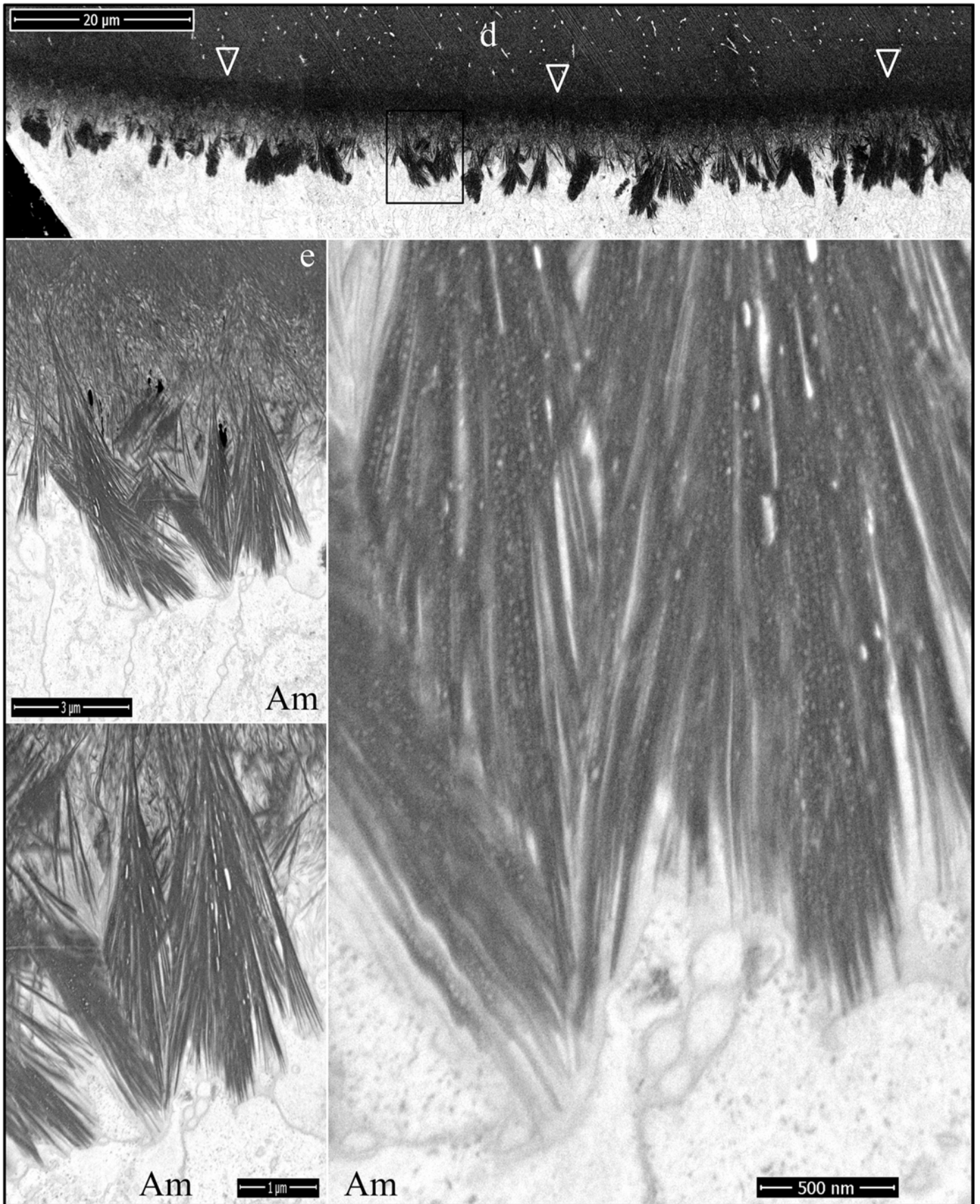


Figure S42. Focused ion beam images of secretory stage enamel forming at Level 2 (mid-lateral) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S41 through S45).



Figure S43. Focused ion beam images of secretory stage enamel forming at Level 2 (mid-lateral) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S41 through S45).

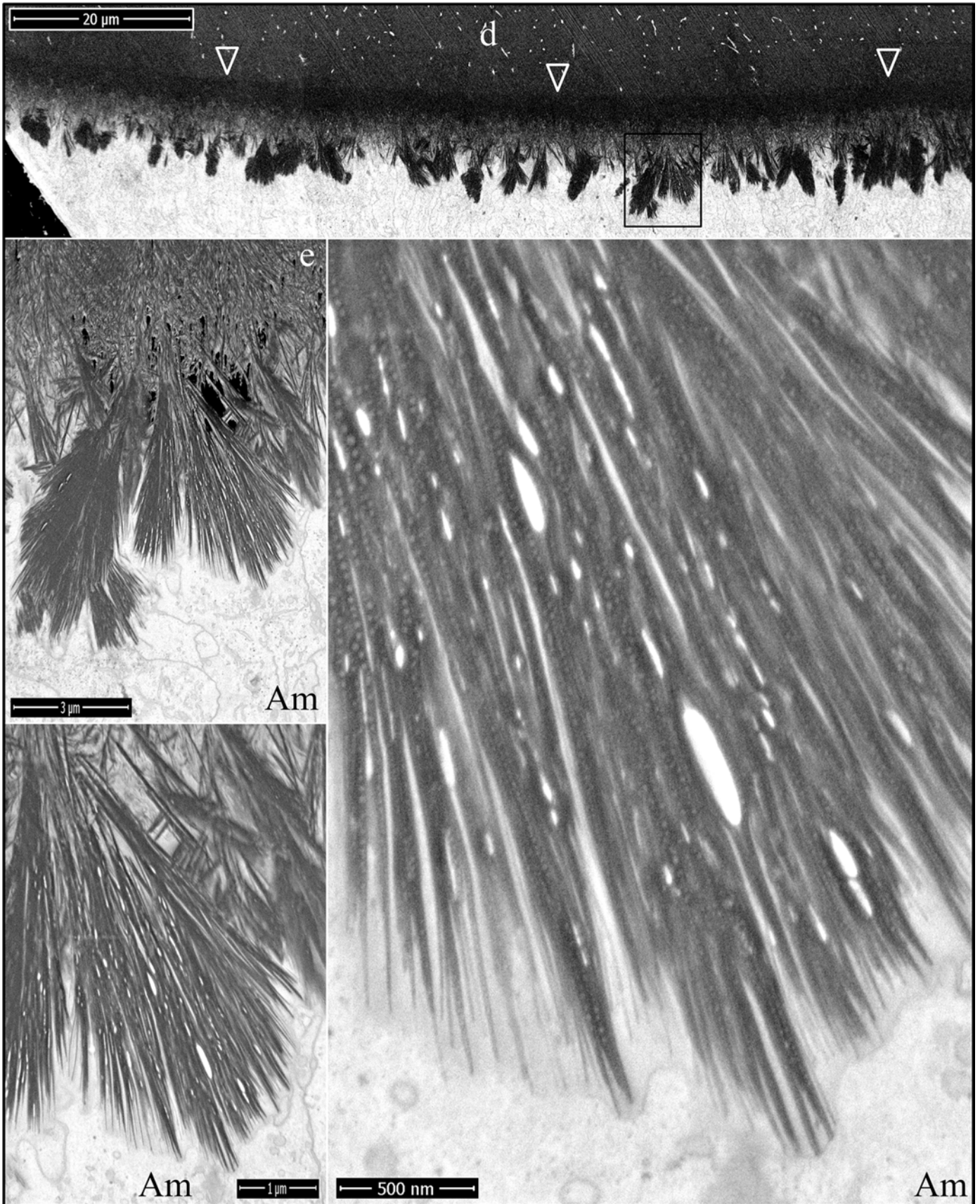


Figure S44. Focused ion beam images of secretory stage enamel forming at Level 2 (mid-lateral) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. High magnification shows small beads linearly arrayed on the mineral surface. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S41 through S45).

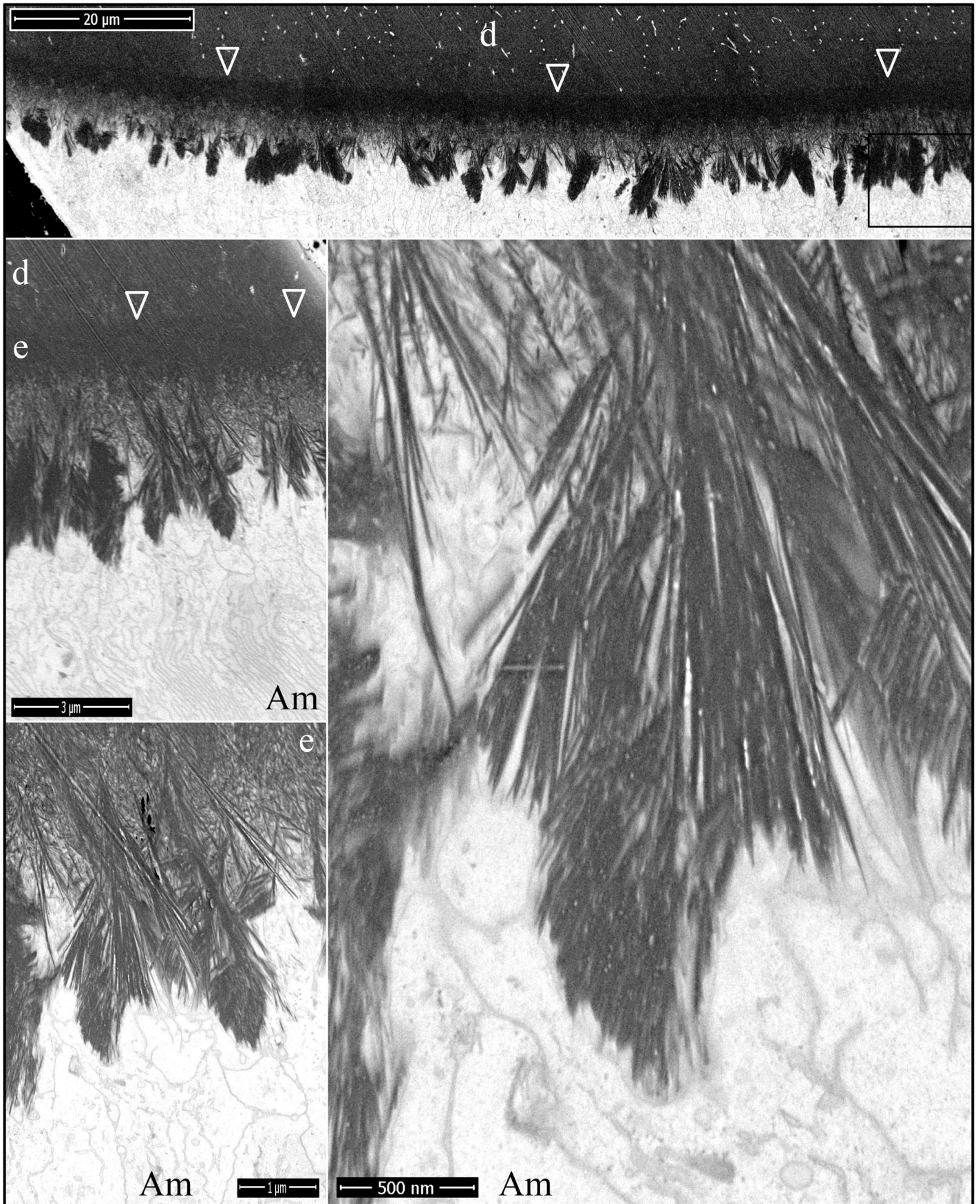


Figure S45. Focused ion beam images of secretory stage enamel forming at Level 2 (mid-lateral) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S41 through S45).

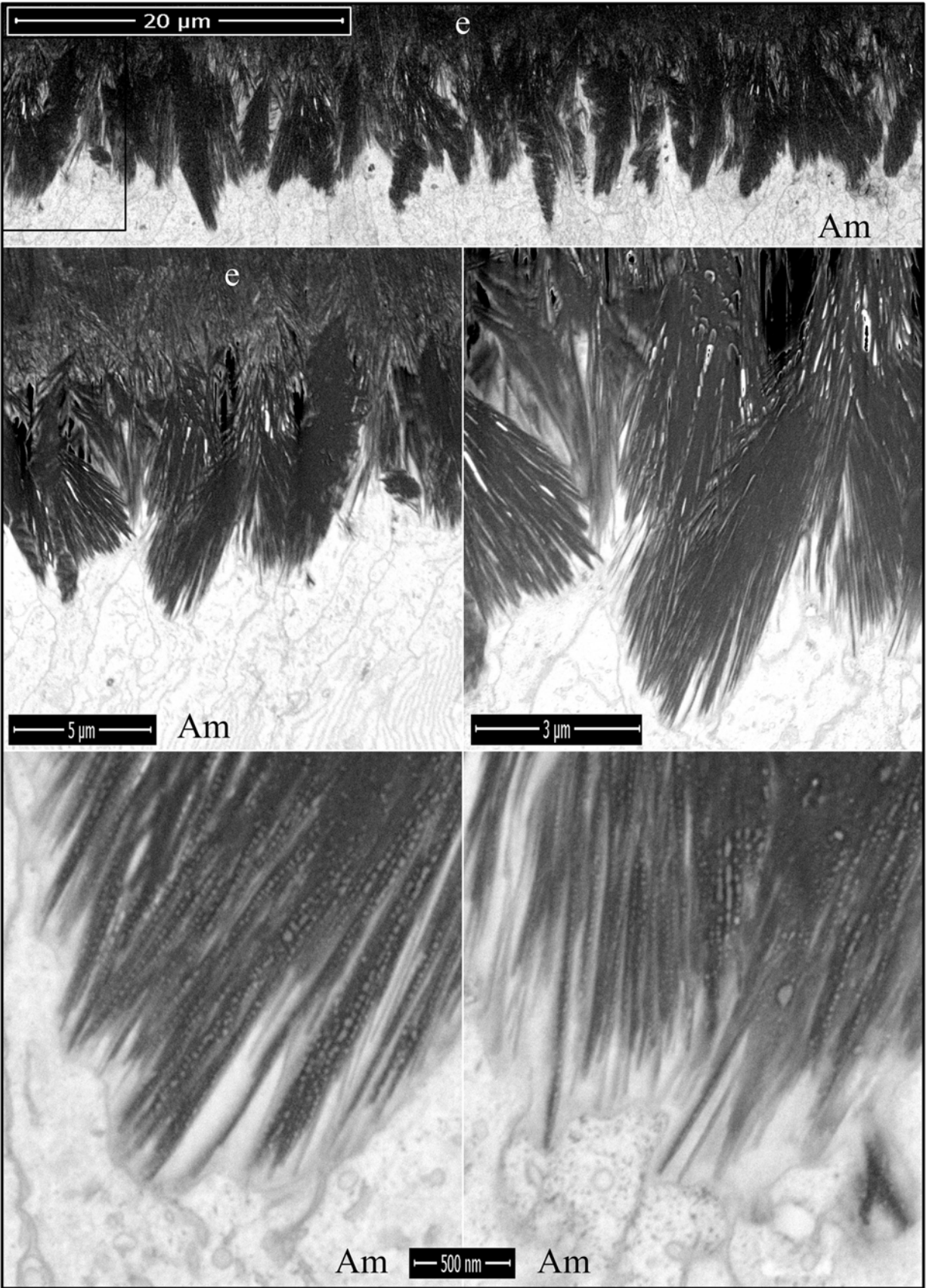


Figure S46. Focused ion beam images of secretory stage enamel forming at Level 2 (central) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. High magnification shows small beads linearly arrayed on the mineral surface. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S46 through S50).

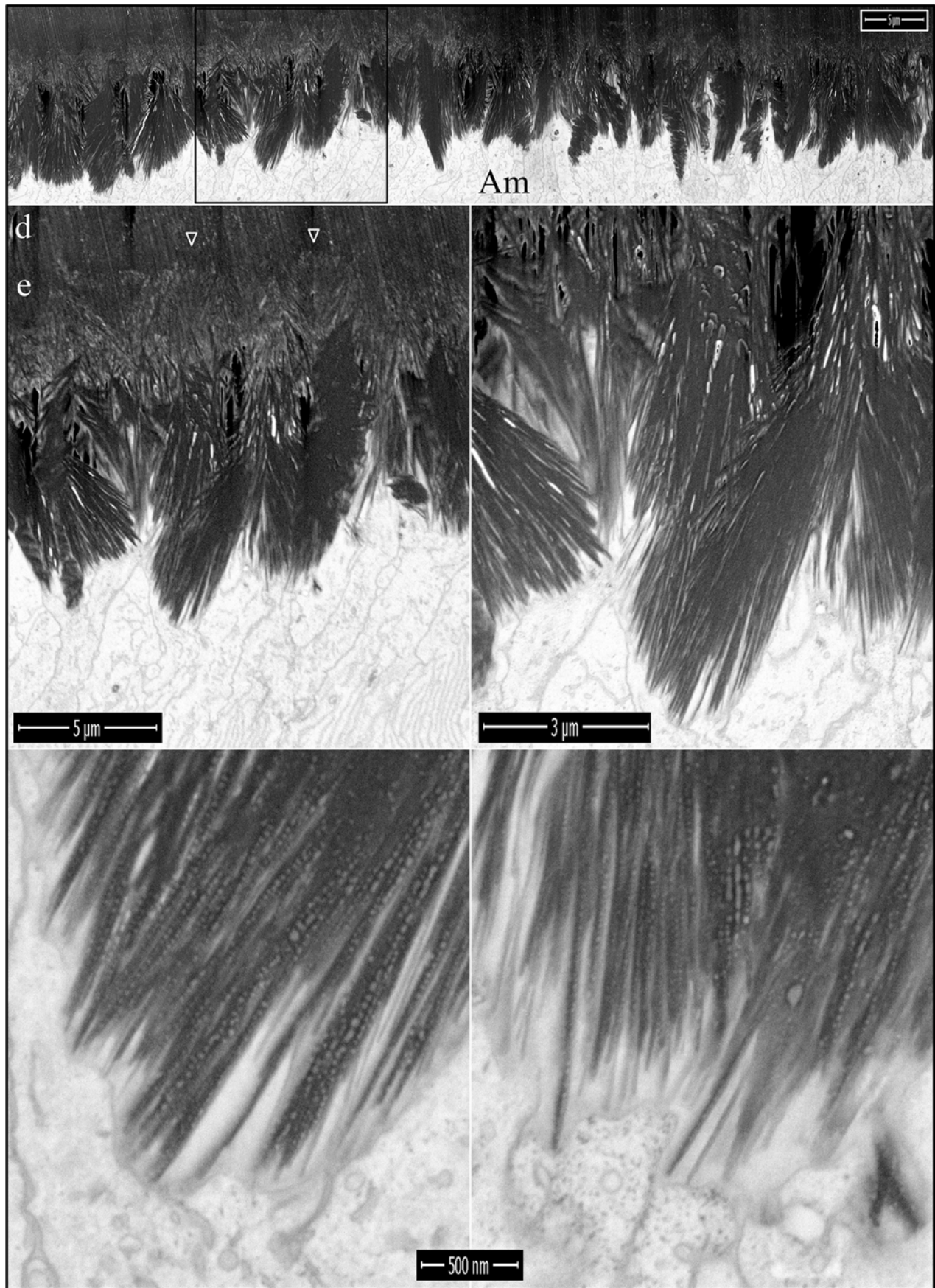


Figure S47. Focused ion beam images of secretory stage enamel forming at Level 2 (central) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S46 through S50).

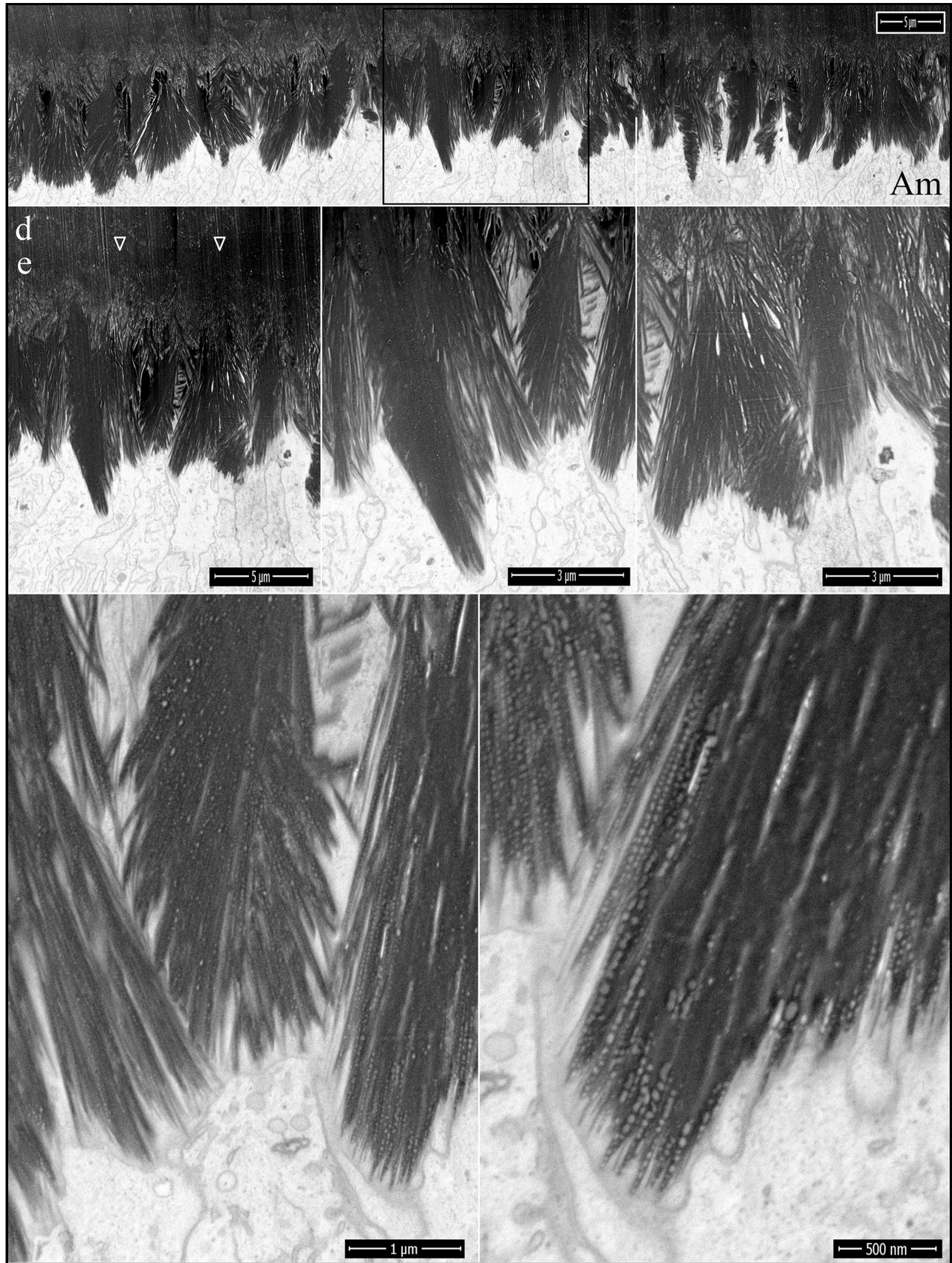


Figure S48. Focused ion beam images of secretory stage enamel forming at Level 2 (central) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. High magnification shows small beads linearly arrayed on the mineral surface. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S46 through S50).

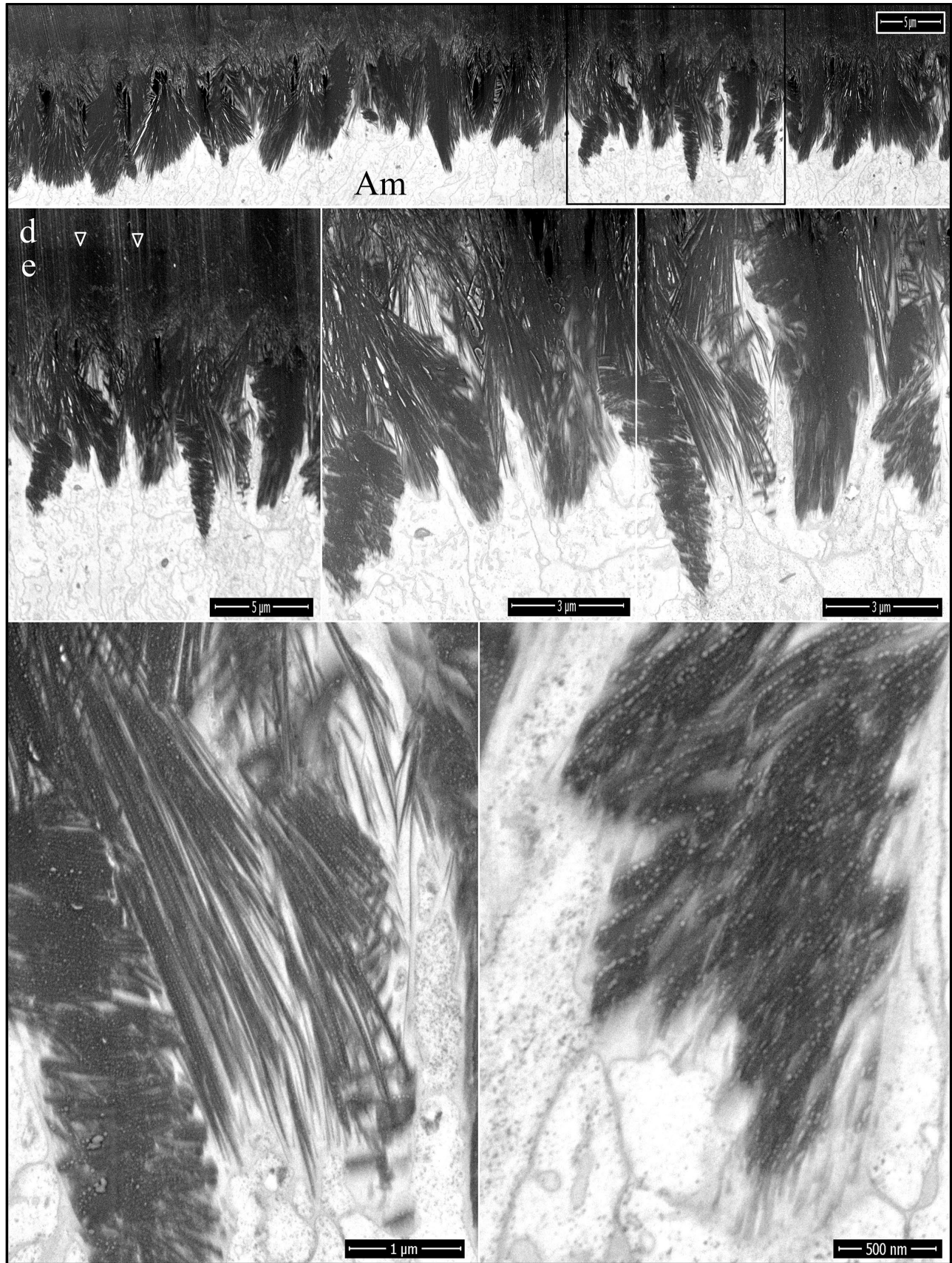


Figure S49. Focused ion beam images of secretory stage enamel forming at Level 2 (central) in an *Amelx*^{-/-} mouse mandibular incisor. **Top:** Low magnification montage of incisor region characterized. The box outlines the region detailed by higher magnification images shown below. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S46 through S50).

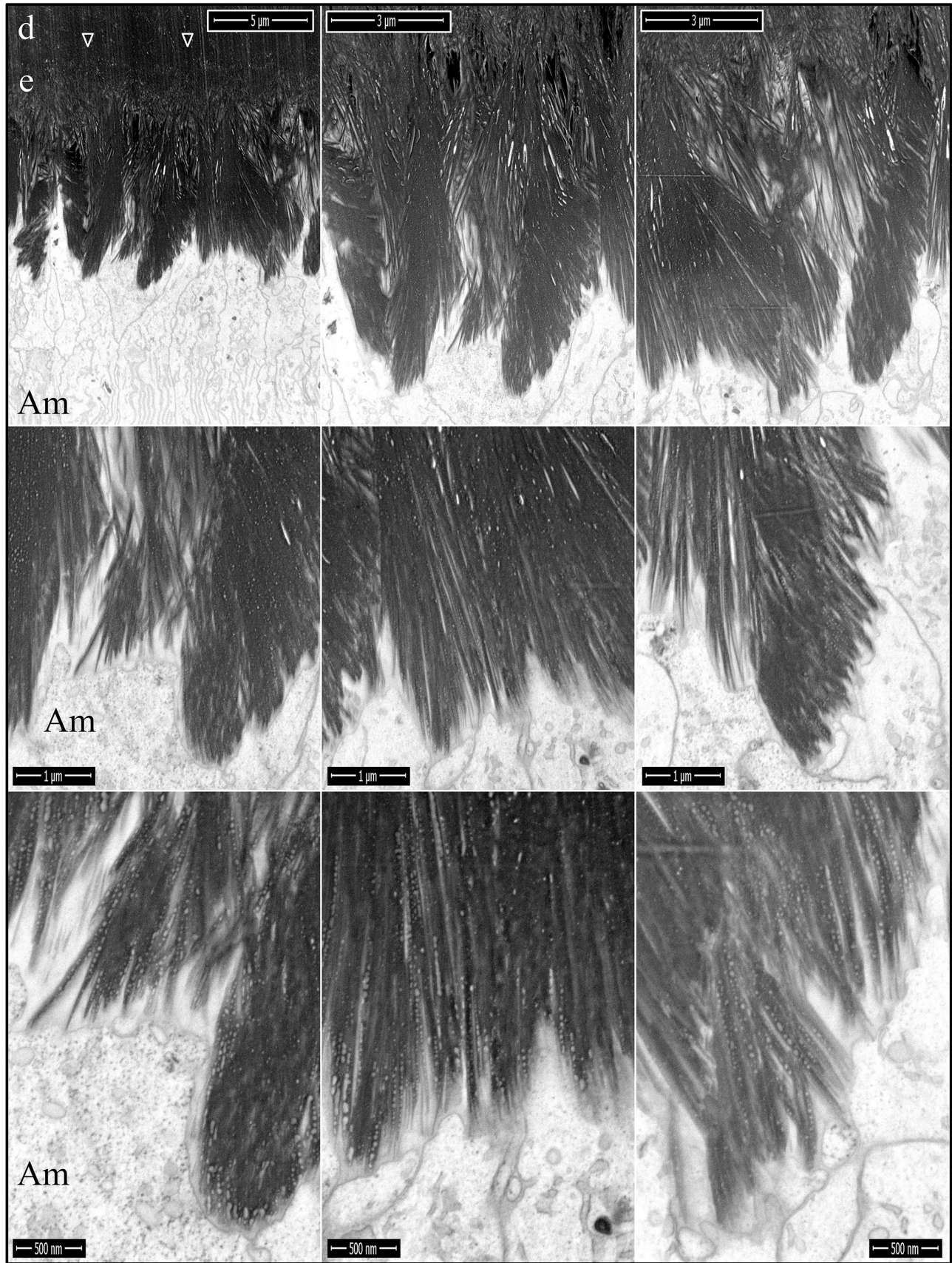


Figure S50. Focused ion beam images of secretory stage enamel forming at Level 2 (central) in an *Amelx*^{-/-} mouse mandibular incisor. These images are higher magnification views from the most advanced (far right) portion of the block. **Key:** Am, ameloblast; e, enamel. This is part of a series of images showing middle plate formation (Figures S46 through S50).

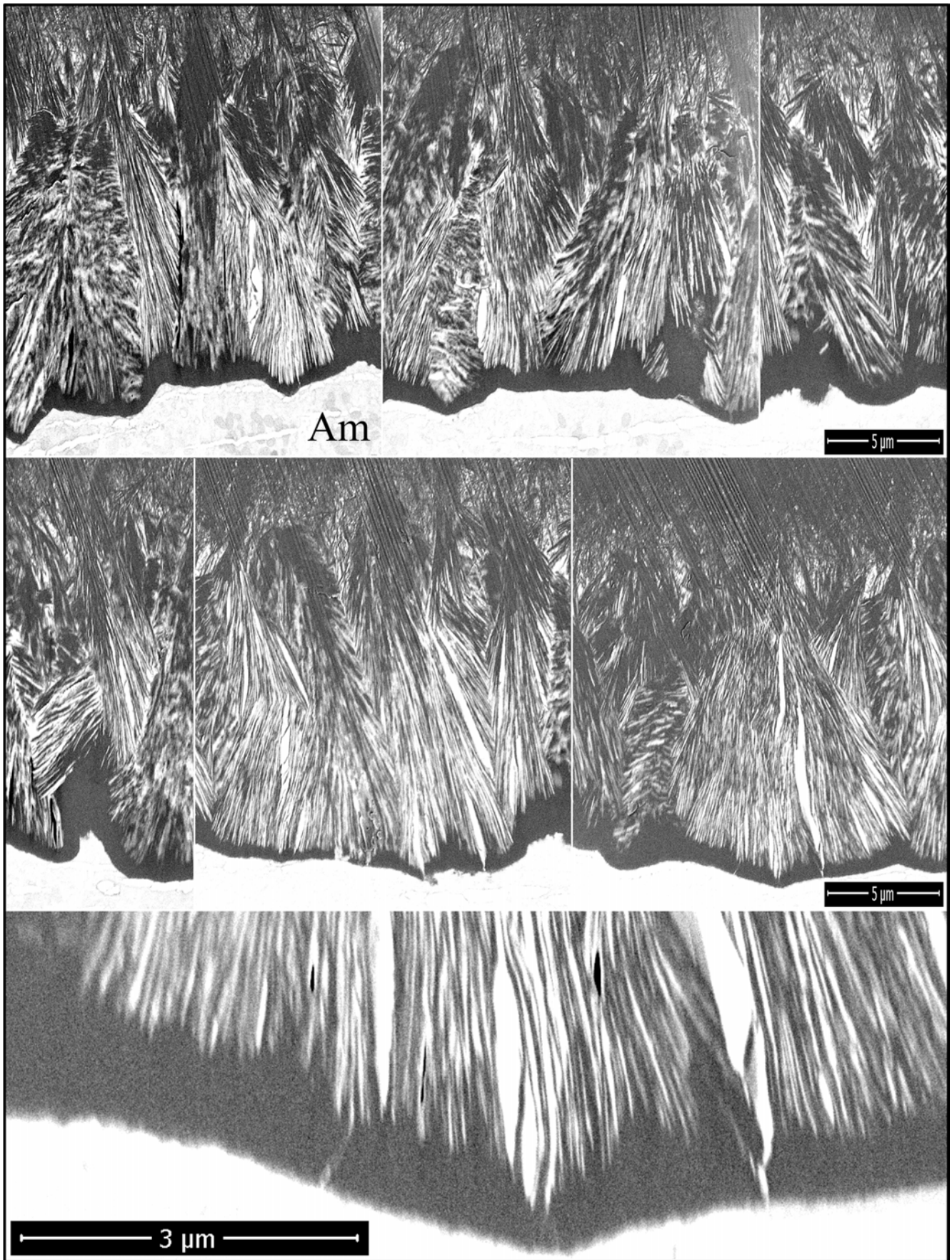


Figure S51. Focused ion beam images of maturation stage enamel forming at Level 6 in an *Amelx*^{-/-} mouse mandibular incisor. These images are higher magnification views detailing the fan-shaped, organization of crystals in the plates of octacalcium phosphate. **Key:** Am, ameloblast. This figure supports Figure 16.