What is claimed is:

1. A medical implant comprising absorbable structural material, the absorbable structural material comprising a reinforcement filler, wherein strength and stiffness properties are anisotropic; wherein said absorbable structural material further comprises a biodegradable polymer; wherein an average density of the absorbable structural material is in the range of 1.3 – 3.0 g/cm^3; wherein said reinforcing filler comprises a plurality of reinforcing fibers and wherein a weight ratio of reinforcing fibers to said biodegradable polymer is in the range of 1:1 to 3:1; or wherein a percentage of reinforcing fibers is in the range of 40% to 50% weight per weight; wherein a plurality of said reinforcement fibers are arranged in parallel to the longitudinal axis of the implant.
2. The medical implant of claim 1, wherein said biodegradable polymer comprises a homopolymer or a copolymer; wherein said copolymer comprises a random copolymer, block copolymer, or graft copolymer; and wherein said biodegradable polymer comprises a linear polymer, a branched polymer, or a dendrimer, of natural or synthetic origin; wherein said biodegradable polymer comprises lactide, glycolide, caprolactone, valerolactone, carbonates (e.g., trimethylene carbonate, tetramethylene carbonate), dioxanones (e.g., 1,4-dioxanone), δ-valerolactone, 1,dioxepanones (e.g., 1,4-dioxepan-2-one and 1,5-dioxepan-2-one), ethylene glycol, ethylene oxide, esteramides, γ-hydroxyvalerate, β-hydroxypropionate, alpha-hydroxy acid, hydroxybutyrates, poly (ortho esters), hydroxy alkanoates, tyrosine carbonates, polyimide carbonates, polyimino carbonates, such as poly (bisphenol A-iminocarbonate) and poly (hydroquinone-iminocarbonate), polyurethanes, polyanhydrides, polymer drugs (e.g., polydiflunisol, polyaspirin, and protein therapeutics), sugars; starch, cellulose and cellulose derivatives, polysaccharides, collagen, chitosan, fibrin, hyaluronic acid, polypeptides, proteins, poly (amino acids), polylactides (PLA), poly-L-lactide (PLLA), poly-DL-lactide (PDLLA); polyglycolide (PGA); copolymers of glycolide, glycolide/trimethylene carbonate copolymers (PGA/TMC); other copolymers of PLA,

such as lactide/tetramethylglycolide copolymers, lactide/trimethylene carbonate copolymers, lactide/d-valerolactone copolymers, lactide/ε-caprolactone copolymers, L-lactide/DL-lactide copolymers, glycolide/L-lactide copolymers (PGA/PLLA), polylactide-co-glycolide; terpolymers of PLA, such as lactide/glycolide/trimethylene carbonate terpolymers, lactide/glycolide/ ε -caprolactone terpolymers, PLA/polyethylene oxide copolymers; polydepsipeptides; unsymmetrically – 3,6-substituted poly-1 ,4-dioxane-2,5-diones; polyhydroxyalkanoates, such as polyhydroxybutyrates (PHB); PHB/b-hydroxyvalerate copolymers (PHB/PHV); poly-b-hydroxypropionate (PbHP); poly-p-dioxanone (PDS); poly-d-valerolactone - poly-ε-capralactone, poly(ε-caprolactone-DL-lactide) copolymers; methylmethacrylate-N-vinyl pyrrolidone copolymers; polyesteramides; polyesters of oxalic acid; polydihydropyrans; polyalkyl-2-cyanoacrylates; polyurethanes (PU); polyvinylalcohol (PVA); polypeptides; poly-b-malic acid (PMLA): poly-b-alkanoic acids; polycarbonates; polyorthoesters; polyphosphates; poly(ester anhydrides); and derivatives, copolymers and mixtures thereof.

3. The medical implant of any of claims 1 or 2, wherein the reinforcing fibers are embedded in a polymer matrix comprising one or more bioabsorbable polymers.
4. The medical implant of any of the above claims wherein a fiber diameter is in a range of 2-40 μm.
5. The medical implant of claim 4, wherein a fiber diameter is in a range of 8-20 μm.
6. The medical implant of claim 5, wherein a fiber diameter is in a range of 12-18 μm.
7. The medical implant of any of the above claims wherein at least 45% of strength is retained following exposure to simulated body fluid (SBF) at 37°C for 3 days.
8. The medical implant of claim 7, wherein at least 60% of strength is retained following exposure to simulated body fluid (SBF) at 37°C for 3 days.
9. The medical implant of any of the above claims wherein at least 50% of elastic modulus is retained following exposure to simulated body fluid (SBF) at 37°C for 3 days.

10. The medical implant of claim 9, wherein at least 70% of elastic modulus is retained following exposure to simulated body fluid (SBF) at 37°C for 3 days.
11. The medical implant of any of the above claims, wherein the flexural modulus exceeds 15 GPa and flexural strength exceeds 150 MPa following 3 months of in vivo implantation.
12. The medical implant of any of the above claims wherein the medical implant is selected from the group consisting of bone fixation plates, intramedullary nails, joint (hip, knee, elbow) implants, spine implants, and other devices for such applications for fracture fixation, tendon reattachment, spinal fixation, and spinal cages.
13. A biocomposite material comprising a biocompatible polymer and a plurality of reinforcing fibers, wherein said reinforcing fibers are in a parallel orientation to the longitudinal axis of the biocomposite material, wherein the average density of the biocomposite material is in the range of 1.1 – 3.0 g/cm^3, wherein a weight ratio of reinforcing fibers to said biodegradable polymer is in the range of 1:1 to 3:1; or wherein a percentage of reinforcing fibers is in the range of 40% to 50% weight per weight.
14. The biocomposite material of claim 13, wherein average density of the biocomposite material is in the range of 1.2 – 2.0 g/cm^3.