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Review

Aerobic granular sludge technology: mechanisms of granulation and biotechnological applications

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1 **Aerobic granular sludge technology: mechanisms of granulation and biotechnological**
2 **applications**

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14
15 **Abstract**

16 Aerobic granular sludge (AGS) is a novel microbial community which allows simultaneous
17 removal of carbon, nitrogen, phosphorus and other pollutants in a single sludge system. AGS
18 is distinct from activated sludge in physical, chemical and microbiological properties and
19 offers compact and cost-effective treatment for removing oxidized and reduced contaminants
20 from wastewater. AGS sequencing batch reactors have shown their utility in the treatment of
21 abattoir, live-stock, rubber, landfill leachate, dairy, brewery, textile and other effluents. AGS
22 is extensively researched for wide-spread implementation in sewage treatment plants.
23 However, formation of AGS takes relatively much longer time while treating low-strength
24 wastewaters like sewage. Strategies like increased volumetric flow by means of short cycles
25 and mixing of sewage with industrial wastewaters can promote AGS formation while treating
26 low-strength sewage. This article reviewed the state of research on AGS formation
27 mechanisms, bioremediation capabilities and biotechnological applications of AGS
28 technology in domestic and industrial wastewater treatment.

29
30 **Keywords:** aerobic granules; biodegradation; EPS; phosphorus removal; nitrogen removal;
31 sewage.

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