Assessment of cell disruption efficiency of *Microcystis aeruginosa* using different mechanical techniques

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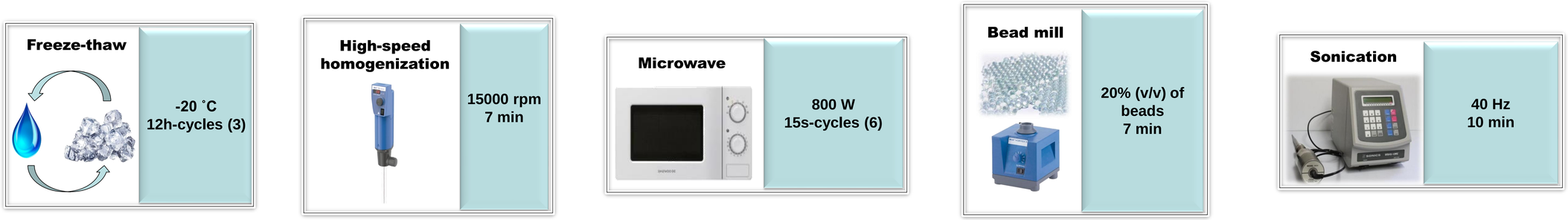
Introduction

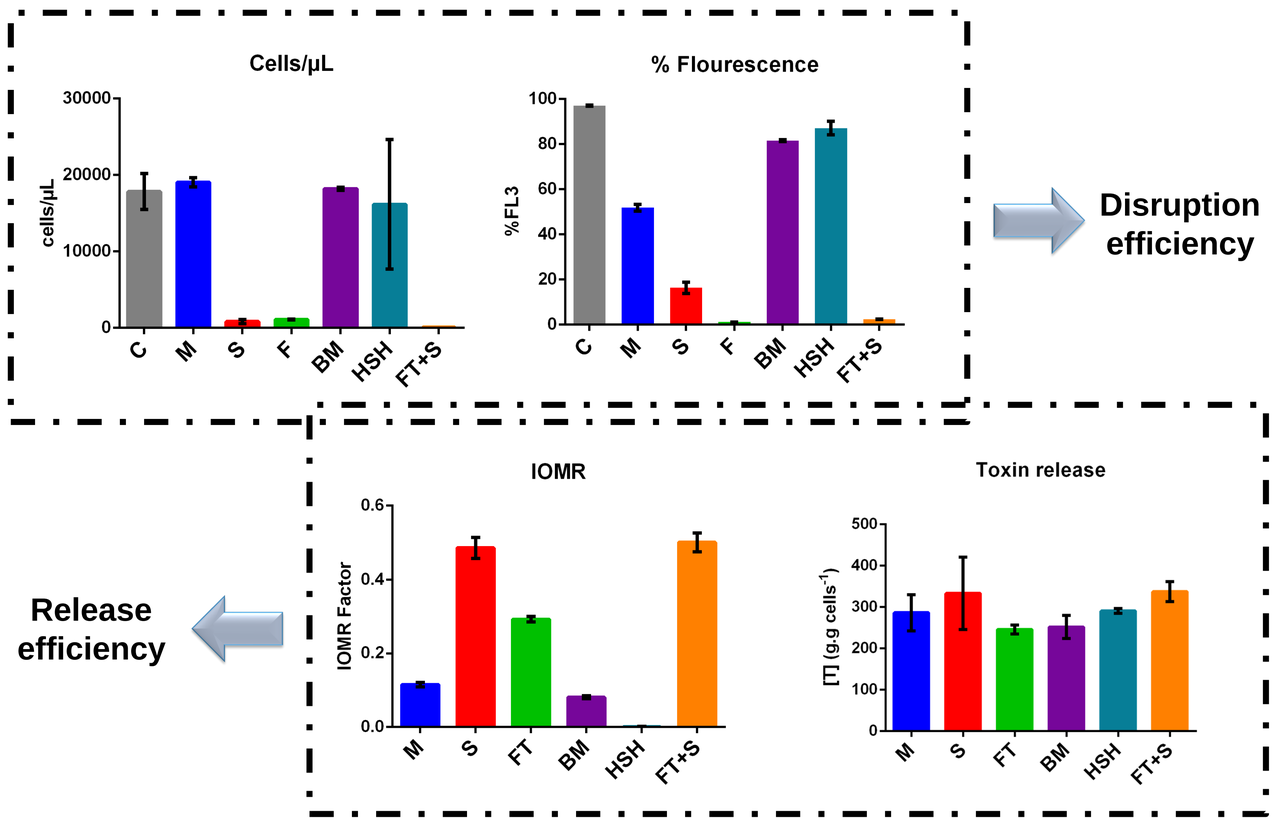
Microcystin (MC), the hepatoxin produced by *Microcystis aeruginosa*, constitutes a major worldwide environmental threat to freshwater aquatic resources that is expected to expand in scale and intensity with global climate change. Thus, the World Health Organization implemented guideline values for MC in water which will certainly increase the need for more and reliable MC's analytical standards. Several cyanotoxins, among which is MC, have been described as promising anticancer, antimicrobial, antifungal, antialgal and insecticide agents. Consequently, the U.S. Environmental Protection Agency has introduced cyanotoxins in its list of substances to be studied as a precursor to regulatory action between 2018 and 2020. Despite the interest, commercial MC availability is still limited due to constraints found in production and downstream processes, which inflate the final price to values as high as 28000€/mg. Therefore, the goal of this work is to compare the efficiency of different cell disruption techniques, which were optimized by us for this cyanobacterium, in order to implement a more cost-effective downstream processing.

Methods



Disruption efficiency | Intracellular organic matter release (IOMR) | Toxin release

Results



Conclusions

Freeze-thaw + Sonication	Higher disruption efficiency ✓
	Higher toxin release ✓
	Higher IOMR ✓

Best methodology

Acknowledgements

This research work was supported by the grant SFRH/BPD/98694/2013 (Bruno Fernandes) and SFRH/BD/52335/2013 (Pedro Geada) from Fundação para a Ciência e a Tecnologia (Portugal). Luís Loureiro is recipient of a fellowship supported by a doctoral advanced training (call NORTE-69-2015-15) funded by the European Social Fund under the scope of Norte2020 - Programa Operacional Regional do Norte. This study was supported by the Portuguese Foundation for Science and Technology (FCT) under the scope of the strategic funding of UID/BIO/04469/2013 unit and COMPETE 2020 (POCI-01-0145-FEDER-006684), Project UID/Multi/04423/2013, Project RECI/BBB-EBI/0179/2012 (FCOMP-01-0124-FEDER-027462), FCT Strategic Project of UID/BIO/04469/2013 unit, by the project NOVELMAR (reference NORTE-01-0145-FEDER-000035), co-financed by the North Portugal Regional Operational Programme (Norte 2020) under the National Strategic Reference Framework (NSRF), through the ERDF, and by BioTecNorte operation (NORTE-01-0145-FEDER-000004) funded by the European Regional Development Fund under the scope of Norte2020 - Programa Operacional Regional do Norte.