RESEARCH LETTER

A proposed post-graduate biotechnology course curriculum at Bangabandhu Sheikh Mujib Medical University

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HIGHLIGHTS

1. Bangabandhu Sheikh Mujib Medical University is yet to introduce a post-graduate biotechnology course.
2. A preliminary course curriculum was developed reviewing course materials from four chosen universities.
3. Most resident physician's agreed or somewhat agreed with the proposed contents.

Biotechnology is a cutting-edge, multidisciplinary discipline that influences numerous industries.[1] Within the health sector, biotechnology encompasses vital domains such as molecular medicine, personalized treatment, and regenerative therapy, reflecting a paradigm shift in medical science.[2] While numerous public and private universities in Bangladesh offer biotechnology courses, Bangabandhu Sheikh Mujib Medical University (BSMMU) the esteemed leading medical university of Bangladesh currently lacks such a courses. This discrepancy highlights an opportunity for BSMMU to offer a biotechnology courses and engage medical professionals in the multifaceted applications of biotechnology. However, developing a curriculum and determining the course content are prerequisites for being a courses. Curriculum development is an ongoing educational process. The purpose of this study was to develop a course curriculum of post-graduate biotechnology course and assess resident physicians' perceptions of that curriculum.

The study was supported by the Integrated Health Science Research Project and a BSMMU research grant. A mixed-method research design was employed. Initially, we created a 'Preliminary draft course content' for the post-graduate biotechnology courses by analysing the existing course content of biotechnology curriculum at four universities that would be more applicable for BSMMU using the Wiseman method.[3] Then, was obtained opinion from the relevant expert through a workshop. Later, a self-administered questionnaire was given to collect views of the resident physicians on the proposed courses content. Questions solicited direct, specific responses on a 5-point Likert scale. Seventy resident physicians of BSMMU were recruited purposively for this. This study's Likert-type scale included 'Disagree = 1', 'Tend to disagree = 2', 'Undecided = 3', 'Tend to agree = 4', and 'Agree = 5'.

The course content of four universities' biotechnology curricula, adapted for the proposed biotechnology course for BSMMU, along with their respective weights, are given in Table 1. A course with a total of 54 credit hours has been designed for three years. Maximum resident physicians (91.1%) either agreed (60.0%) or tended to agree (31.1%) with the proposed course content for the post-graduate biotechnology programme.

As medical science undergoes rapid evolution, integrating biotechnology into medical education becomes essential for ushering in this transformative era. The curriculum development process in this study employs the Wiseman approach,[3] leveraging experiences from established institutions and an expert panel.[4] This methodology ensures that the proposed curriculum is both relevant and adapted to the distinctive context of BSMMU. The proposed three years, 54 credit hours course strikes a balance between in-depth exploration and practical application of biotechnological principles. Moreover, the positive response from resident physicians underscores the potential acceptance and relevance of the courses with

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TABLE 1 The course content of biotechnology curriculum of four universities and adapted for BSMMU with weightage distribution

Phases of course	Course name		Credit	Adapted curriculum for BSMMU†			
			(Total 54)*	AIIMS[5]	JUST[6]	NSU[7]	VIT[8]
Phase - A (Duration 6 months)	1.	Fundamental courses					
Year 1, Semester 1, 12 credits	2.	Advanced Biochemistry	3	√	√	√	√
	3.	Molecular Cell Biology	3	√	√		
	4.	Microbial Biotechnology	3		√	√	√
	5.	Single Gene and Chromosomal Disorder	3	√			√
Phase - A (Duration 6 months)	6.	Immuno-biotechnology	3	√		√	
Year 1, Semester 2, 12 credits	7.	Molecular Virology	3			√	
	8.	Industrial Biotechnology	3			√	√
	9.	Cell signaling	3				√
Phase - A (Duration 6 months)	10.	Bioinformatics	3	√		√	√
Year 2, Semester 3, 12 credits	11.	Biostatistics	3	√	√	√	√
Any 4 core courses*	12.	Complex Genetic Disorder	3				
	13.	Ethics and Genetic Counselling	3	√			√
	14.	Pharmaceutical Biotechnology	3			√	
	15.	Genomics and Proteomics	3	√			√
Phase - A (Duration 6 months	16.	Biosafety and Regulations and QA/QC for the Pharmaceutical and Biotechnology Industries	3	√		√	√
Year 2, Semester 4, 12 credits	17.	Epigenetics and Metagenomics	3		√		
	18.	Sequencing technologies	3	√		√	
	19.	Thesis protocol	3	√	√	√	√
Phase - B (Duration 1 Year)	20.	Thesis (compulsory)	6	√	√	√	√
Year 3, 6 credits							

*The total count doesn't sum up to 54 because, in phase A, semester 3, four out of six courses are required
†BSMMU: Bangabandhu Sheikh Mujib Medical University; AIIMS: All India Institute of Medical Sciences, India; NSU: North South University, Bangladesh; JUST: Jashore University of Science and Technology, Bangladesh; VIT: Valore Institute of Technology, India.

the perceived needs of aspiring medical professionals. In conclusion, the outlined course content for the biotechnology might assist the decision makers formulating a tailored course for BSMMU.

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Author Contributions

Concept and design: SKB, LAB. Acquisition, analysis, and interpretation of data: SKB, LAB, MMM. Manuscript drafting and revising it critically: LAB, MMM, SKB. Approval of the final version of the manuscript: LAB, MMM, SKB. Guarantor accuracy and integrity of the work: SKB, LAB.

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Conflict of Interest

The authors have no conflict of interest to declare.

Ethical Approval

The study was conducted following the ethical clearance (memo no: BSMMU/2022/6710; date: 06 July 2022) from the Institutional Review Board of BSMMU.

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