

## Field Property for Modelling Biological Process

Meena Kharatmal

Homi Bhabha Centre for Science Education (Tata Institute of Fundamental Research), Mumbai, India

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Biology as a subject is concerned with structure and function (e.g. pancreatic cells secrete insulin). More recently, biology has seen a shift towards process-centric language (e.g. pancreatic cells has role in secretion of insulin), especially within the philosophy of biology (Nagel, 1979; Rosenberg, 1985; Woodger, 1953). We represent this shift through nominalization (Halliday, 2006), for e.g. the structure term 'insulin' is represented to an explicit process-centric term 'secretion of insulin'. Understanding this shift is significant for science education. The motivation of this study is to focus on process-centric biology representing dynamic statements for modeling biology language in high school biology textbooks (NCERT, 2007) followed in India. We focus on the register variable of field using an SFL framework for representing biological processes as dynamic activities with momenting (Doran & Martin, 2021; Unsworth, 2020). We consider how the textbooks construe field in terms of properties for modeling processes as change in state (Dori, 2002; Kharatmal & Nagarjuna, 2013; von Wright, 1963). Properties enable not only rich descriptions of phenomena but also quantification in biological processes. Properties depict changes in physical qualities or measurable quantities. Every process i.e. momented activity that undergoes change has a prior-state and a post-state. In prophase, the momented activities include 'chromatin condensation'; 'chromatin folding ie shortening'; 'changes in cell'. During 'chromatin condensation', the object chromatin is 'less dense' in prior-state and becomes 'more dense' in post-state. The process-centric representation can facilitate for understanding the changes in property of momented activities. This has pedagogical implications for modelling processes in biology.

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