

# A functional differential equation from cell biology

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## Abstract

We define a class of functional differential equations (FDE) that contains a certain differential equation with state-dependent delay (SD-DDE), implicitly defined via a threshold condition depending on a state component. The SD-DDE has been established in the literature as a biomedical model. For these equations semiflows on state spaces of  $C^1$ - functions (the solution manifold) and Lipschitz functions will be analysed. For both, FDE and SD-DDE, using the structure of the FDE class, we elaborate new methods to analyse global asymptotic stability, ultimate compactness, i.e., the existence of a compact set that attracts points of the state space, and persistence and conclude with general conditions for these properties to hold. I will present a selection of these topics.

## References

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