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原著

Pledorina Califonicaの細胞分裂過程および細胞配列の解析

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Analysis of Division Process and Cell Arrangement in Pleodorina Californica.

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Abstract

Continuous division of a mature reproductive cell (R cell) of Pleodorina californica brings about a monolayer cell sheet, which folds up to make a hollow spherical colony. The posterior half of a colony is occupied with R cells and the anterior half is occupied with somatic cells (S cells). Observation of this life cycle in detail leads to a hypothesis that cells located in the peripheral region of a sheet are predetermined to differentiate into R cells and cells located in the middle region are predetermined to S cells. In this paper, the division history of cells within a sheet was followed up completely. With every division, symbol R was given to a daughter cell which took a more outer position of the sheet and symbol S was given to another daughter cell which took a more inner position. Thus lineage of cells was expressed in a special sequence of S or R. The degree of tendency to differentiate into R cell was hypothetically estimated,depending on the number and arrangement of symbol R. All of the cells within a sheet were lined up in numerical order according to their degree into differentiate into R cell. It was clearly shown that cells estimated to have a larger ability to differentiate into R cell occupied a more outer position within a cell sheet.

要 約

Pledorina Californicaの1個の成熟したreproductive cell(R cell)は連続する細胞分裂により単層の細胞シートを形成する.シートはやがておりたたまれて中空の球状のColonyを形成する.colonyの前半球はsomatic cell(S cell)が占め,後半球はRce1lが占める.このような1ifecycleのくわしい観察

により,シートの周辺部分に位置する細胞が将来R cellに分化し,シートの中央部分に位置する細胞が将来S cellに分化することが明らかとなった. 本論文において,シート内の全ての細胞の分裂の歴史を完全に追跡した.各分裂で形成された2個の娘細胞のうち,シートのより外側に位置する方にRの記号を,より内側に位置する細胞にSの記号を与えた.このようにして細胞の系譜をSまたはRの並列により表すことができた.　シートを構成する細胞が将来Rcellに分化する可能性を,系譜に表されたRの数と並び方に基づいて解析し,順序をつけた.この結果Rcellに分化しやすい細胞ほどシートのより外側に位置するという関係が明瞭に示された.