

Usnic acid as a new compound to study the cell cycle in *Chlamydomonas reinhardtii*.

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Unicellular algae cell cycle can be segmented in many phases, including the commitment point (CP) which is a point-of-no-return where the cell decides to divide. It was previously shown that CP was partly controlled via Cyclin Dependent Kinases (CDKs). However, our transcriptomics analysis of synchronised *Chlamydomonas reinhardtii* grown in different light intensities showed that the strongest common response expressed from illumination until CP is the ribosome biogenesis¹. We thus hypothesized that the ribosome concentration was one of the factors involved in CP attainment. We grew synchronised *Chlamydomonas* with the lichen compound usnic acid (UA), which was shown to inhibit the ribosome biogenesis in yeast². Our results has shown that cells in UA had delayed CP and division, as well as modified size and reduced amount of macromolecules per cell. We also have shown that the expression of ribosome related genes was affected in UA compared to the control. We propose the UA as a new compound to reliably study the cell cycle in *Chlamydomonas reinhardtii*.

¹Transcriptomic Illuminations: How light intensity reshapes the *Chlamydomonas reinhardtii* cell cycle. Firas Louis, P.V. Sijil, Bipasha Bhattacharjee, Martin Mora-Garcia, Rabinder Singh, Kateřina Bišová. bioRxiv 2026.07.26.740802; doi: <https://doi.org/10.64898/2026.07.26.740802>

²Kofler L, Grundmann L, Gerhalter M, Prattes M, Merl-Pham J, Zisser G, Grishkovskaya I, Hodiřnau VV, Vareka M, Breinbauer R, Hauck SM, Haselbach D, Bergler H. The novel ribosome biogenesis inhibitor usnic acid blocks nucleolar pre-60S maturation. Nat Commun. 2024 Aug 29;15(1):7511. doi: [10.1038/s41467-024-51754-3](https://doi.org/10.1038/s41467-024-51754-3).