Dynamics of the nuclear pore complexes during nuclear differentiation in ciliate *Tetrahymena thermophila*

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SUMMARY

Ciliated protozoa have two functionally distinct nuclei, macronucleus (Mac) and micronucleus (Mic). These nuclei are differentiated from a zygotic nucleus formed during conjugation. Because the nuclear pore complex (NPC) of Mac and Mic comprise different sets of nucleoporins, nucleoporins of the zygotic nucleus must be differentiated to the Mac-type or Mic-type nucleus during differentiation. To elucidate this process, we conducted live cell imaging associated correlative light electron microscopy (live CLEM): living mating pairs were observed with a fluorescence microscope; at the time when nuclear differentiation was occurring during observation, they were fixed *in situ* for electron microscopy. We found newly assembling nuclear envelope formed redundant nuclear envelope in both newly differentiating Mac and Mic, and the assembling nuclear envelope contained the newly assembled NPCs in the new Mac but not in the Mic. We also performed FRAP analysis to measure the mobility of GFP-nucleoporins on the rim of the differentiating nuclei. Results show that the new Mac, but not the new Mic, was assembling the nucleoporins on the nuclear rim. These results suggest that the dynamic assembly of the nucleoporins might be involved in nuclear differentiation in *Tetrahymena thermophila.*