



Title	Telomerase activity and telomere sequence in the Jellyfish Cassiopea sp.
Author(s)	Ojimi, Michiko; Isomura, Naoko; Hidaka, Michio
Citation	琉球大学21世紀プログラム「サンゴ礁島嶼系の生物多様性の総合解析」平成18年度成果発表会
Issue Date	2007-03-10
URL	http://hdl.handle.net/20.500.12000/613
Rights	

PG-3 Telomerase activity and telomere sequence in the Jellyfish *Cassiopea* sp.

Michiko Ojimi¹, Naoko Isomura¹, Michio Hidaka²

¹Graduate School of Engineering and Science, University of the Ryukyus, Okinawa

²Faculty of Science, University of the Ryukyus, Okinawa

The scyphistome of the jellyfish, *Cassiopea* sp. form larvae-like vegetative buds, which detach from the scyphistome and metamorphose into polyps (scyphistomes). This asexual reproduction cycle via asexual propagules seems to continue endless in a laboratory condition. Once scyphistomes are infected with zooxanthellae, they undergo metamorphosis and form medusae, which do sexual reproduction and might be mortal. Telomeres, the repetitive nucleotide sequences with associated proteins at the ends of eukaryotic chromosomes, generally become shortened during cell division and the length of telomeres is considered to reflect age of cells. As the first step to understand the different life spans of scyphistome and medusa stages of *Cassiopea* sp., we measured telomerase activity in scyphistomes and young medusae using the stretch PCR method (Tatematsu *et al.* 1996). If tissue extract has telomerase activity, telomere sequences are added to an oligonucleotide substrate by the telomerase activity, and the resulting DNA fragments with various numbers of telomere sequences were detected by PCR. The kit used (TeloChaser kit, TOYOBO) was designed to amplify DNA fragments with vertebrates telomere sequence, (TTAGGG)_n, and the presence of ladder pattern with 6 bps intervals indicates positive telomerase activity. We found telomerase activity in tissues of both scyphistomes and young medusae. We cloned and sequenced the PCR products of the ladder pattern and the obtained sequences containing (TTAGGG)_n. Although the telomere sequence is highly conserved in vertebrates, invertebrates show considerable diversity in telomere sequences and the TTAGGG universal sequence has not been found in invertebrates until recently (i.e. freshwater snail, Nomoto *et al.* 2001; corals, Sinclair *et al.* 2006). This is the first report that the Jellyfish *Cassiopea* sp. has telomerase activity and telomere sequence of TTAGGG. As far as we know this is the second report of cnidarians that has TTAGGG universal telomere sequence.