Let $U_q^-(w)$ be the quantum unipotent subgroup associated with a Weyl group element w of a symmetric Kac-Moody Lie algebra $\mathfrak{g}$. Kimura showed that it is compatible with Kashiwara-Lusztig's dual canonical base. By the work of Geiss-Leclerc-Schröer, it has a structure of a quantum cluster algebra. It is conjectured that the dual canonical base contains quantum cluster monomials.

Recall that Geiss-Leclerc-Schröer showed that Lusztig's dual semicanonical base contains cluster monomials. And a dual semicanonical base element corresponds to an irreducible component of Lusztig's lagrangian subvariety. Let Λ_b be an irreducible component, which corresponds to a cluster monomial m. By Kashiwara-Saito, Λ_b corresponds to a (dual) canonical base element b. I conjecture a following statement: Let b' be another dual canonical base element in $U_q^-(w)$ and $P_{b'}$ be the corresponding perverse sheaf. If its singular support $SS(P_{b'})$ contains Λ_b, then $b' = b$.

Assuming this conjecture, I can prove that b, specialized at $q = 1$, is the given cluster monomial m, i.e., the dual semicanonical base element is the specialization of the canonical base element in this case. Probably with a little more effort, I can also prove that b is a quantum cluster monomial.