

Plans of my research

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● Parameter of tunnels

- (1) Finding the relation between two tunnel parameters of one knot.
- (2) Characterizing Dehn surgeries along tunnel number one links yielding the 3-sphere. When a link L has a Dehn surgery yielding the 3-sphere, by putting L' be the dual link of L , we can say that L and L' have homeomorphic exteriors. Finding the relation between tunnel parameters of L and L' .

● Heegaard splitting of 3-manifold obtained by Dehn surgery

- (3) For knots in the 3-sphere, showing that the Heegaard genus of 3-manifold obtained by Dehn surgery along a knot does not decrease more than 2 from the Heegaard genus of the knot exterior.

● Site-specific recombination

- (4) Characterizing band surgery from $(2,p)$ -torus link (resp. knot) to $(2,p-1)$ -torus knot (resp. link) for all k .
- (5) Characterizing rational tangle surgeries from $(2,2k)$ -torus link to $2k+1$ crossing knots for small k