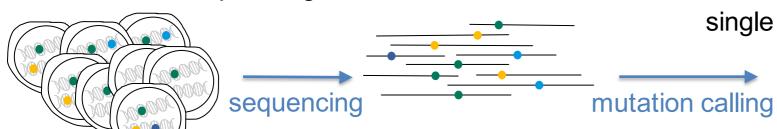


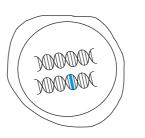
### **Onctopus: Reconstructing the Subclonal Composition**

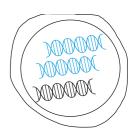
bulk sequencing tumor data

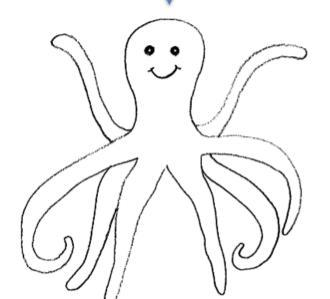


single nucleotide variation

copy number aberration



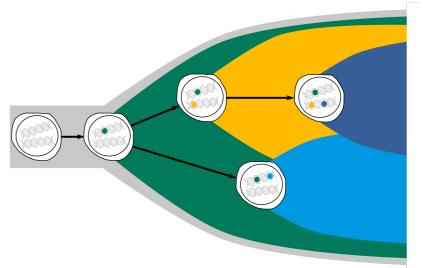




input data

$$\max \sum_{i} \operatorname{cna}_{z_i} \cdot \operatorname{cna}_{y_i} + \sum_{j} \operatorname{snv}_{z'_j} \cdot \operatorname{snv}_{z'_j}$$

combinatorial optimization solved with mixed integer linear programming



most likely reconstruction