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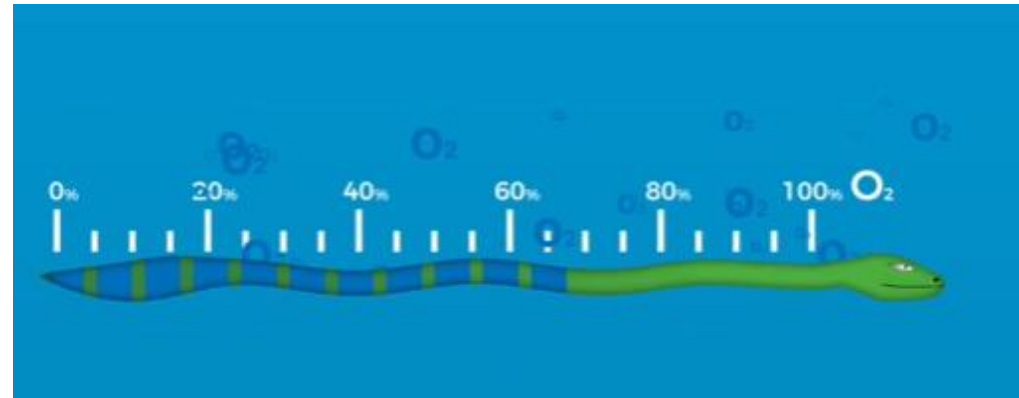
Assembling high-quality sea snake genomes to investigate the genetic basis of aquatic adaptation

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AGTA | Poster 41

Background

- Intake oxygen through their skin and expel carbon dioxide
- Process done at much lower temperatures and pressures than industrial gas separation





Shaw's sea snake (*Hydrophis curtus*)



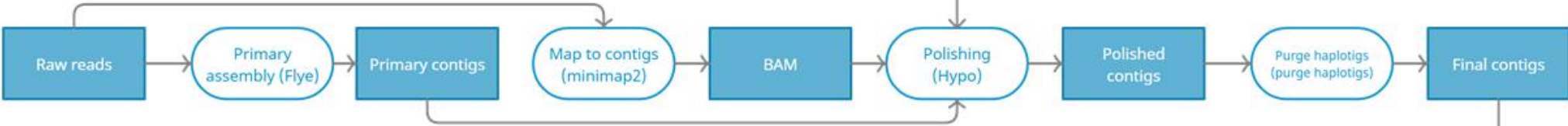
Ornate reef sea snake (*Hydrophis ornatus*)

Genome assembly & analysis pipeline

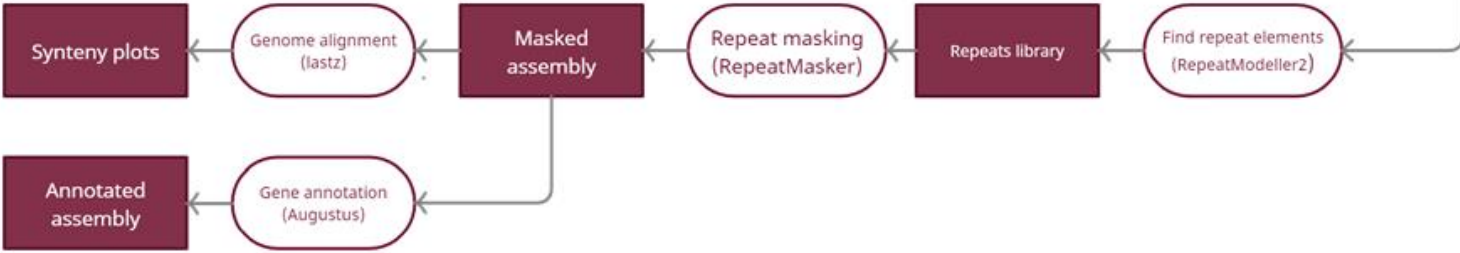
ILLUMINA



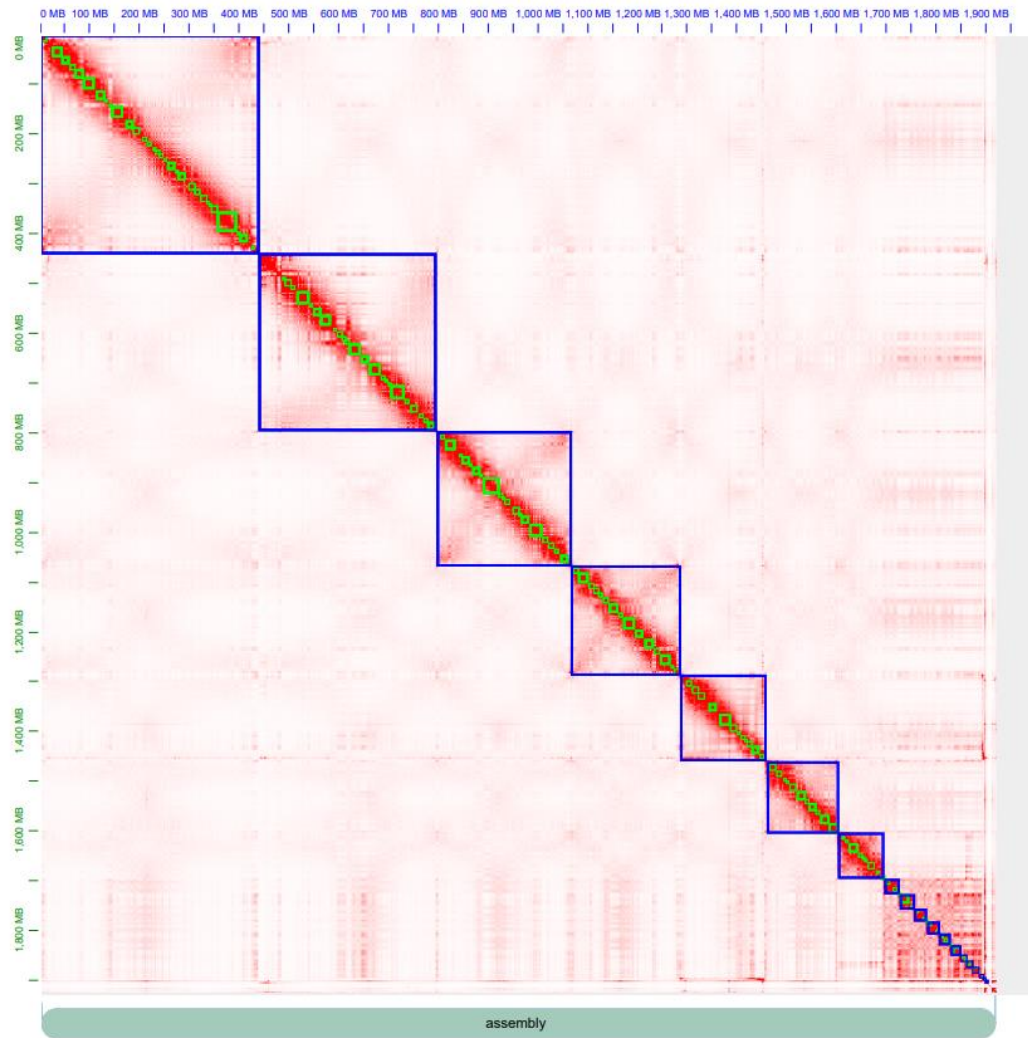
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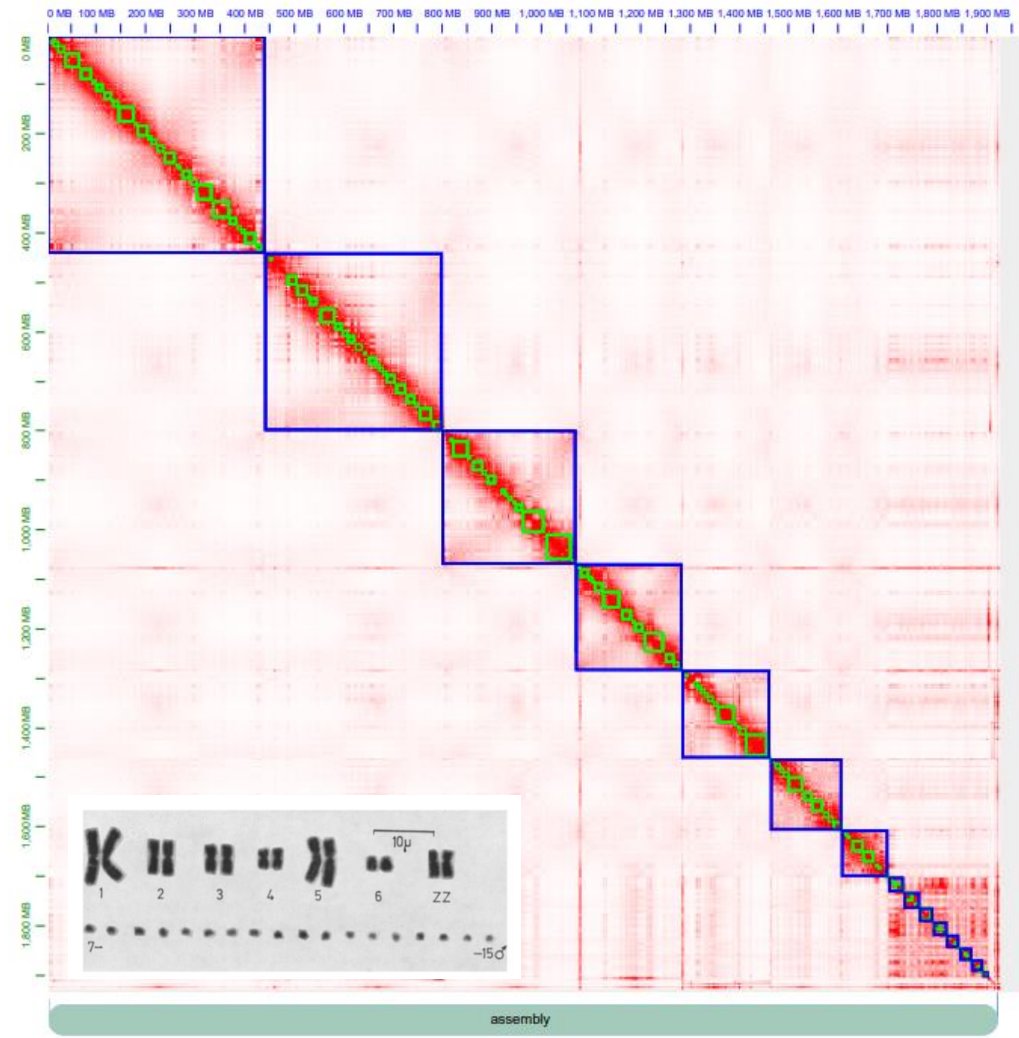
Hi-C



Hi-C Contact Maps



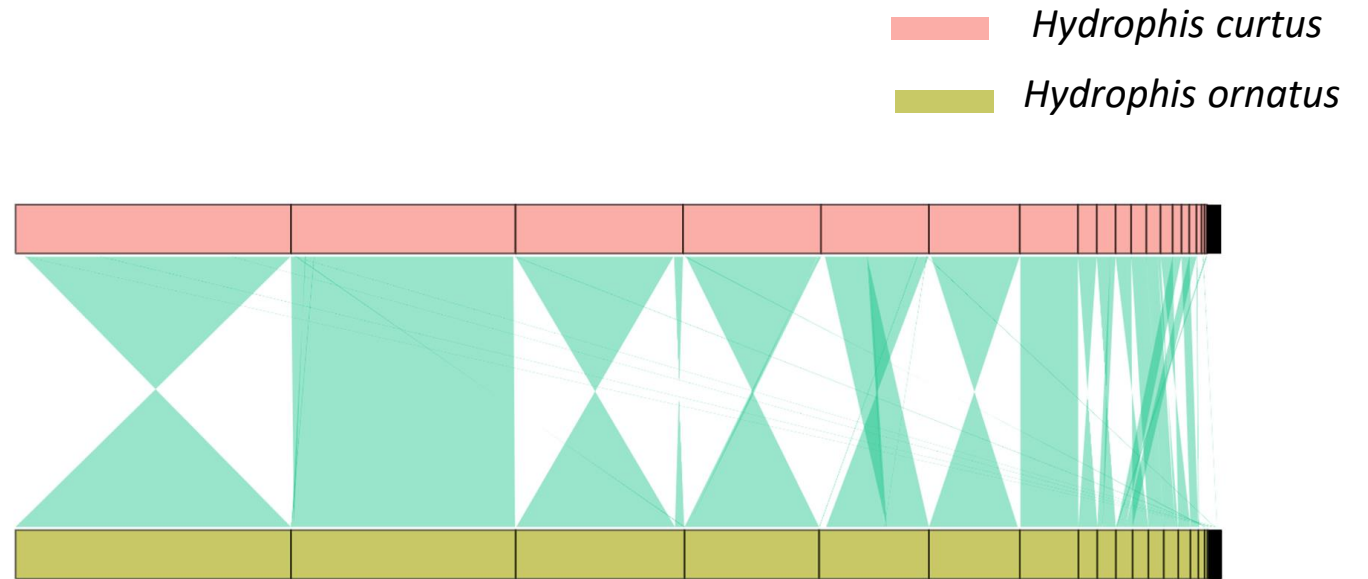
Hydrophis curtus



Hydrophis ornatus

Assembly QC & synteny plot

Stats	<i>Hydrophis curtus</i>	<i>Hydrophis ornatus</i>
Contigs	669	422
Largest contig (Mb)	440.26	440.63
Total length (Gb)	1.92	1.93
N50 (Mb)	267.95	269.21
BUSCO (%)	91.6	91.0



Annotation

	<i>Hydrophis curtus</i>	<i>Hydrophis ornatus</i>
Genes	23,346	24,316

CAH	H. curtus (chrom)	H. orn (chrom)
CAH 1	N/A	N/A
CAH 2	3	3
CAH 3	3	3
CAH 4	1 and 5	1 and 5
CAH 5	10	11
CAH 6	17	16
CAH 7	10	11
CAH 8	3	3
CAH 9	2	18
CAH 10	2	2
CAH 11	5	5
CAH 12	12	13
CAH 13	3	3
CAH 14	15	15
CAH 15	5 and 14	5 and 10

Homo sapiens GSAKTILNNGKTCRVVFDD
Rattus rattus GSAKTILNNGKTCRVVFDD
Python bivittatus GASKNMRNTGKTLRIAFDD
Thamnophis elegans GAAKNIRNTGKTLRIAFDD
Hydrophis ornatus GAAKNIRNTGKILRIAFDD
Hydrophis curtus GAAKNIRNTGKILRIAFDD
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Next steps

- Assembling two new sea snakes (*Hydrophis elegans* and *Aipysurus lavezis*) to add to analysis
- Investigate respiration genes
- Compare to terrestrial snakes
- Provide a resource for investigating the genetic architecture of marine adaptation