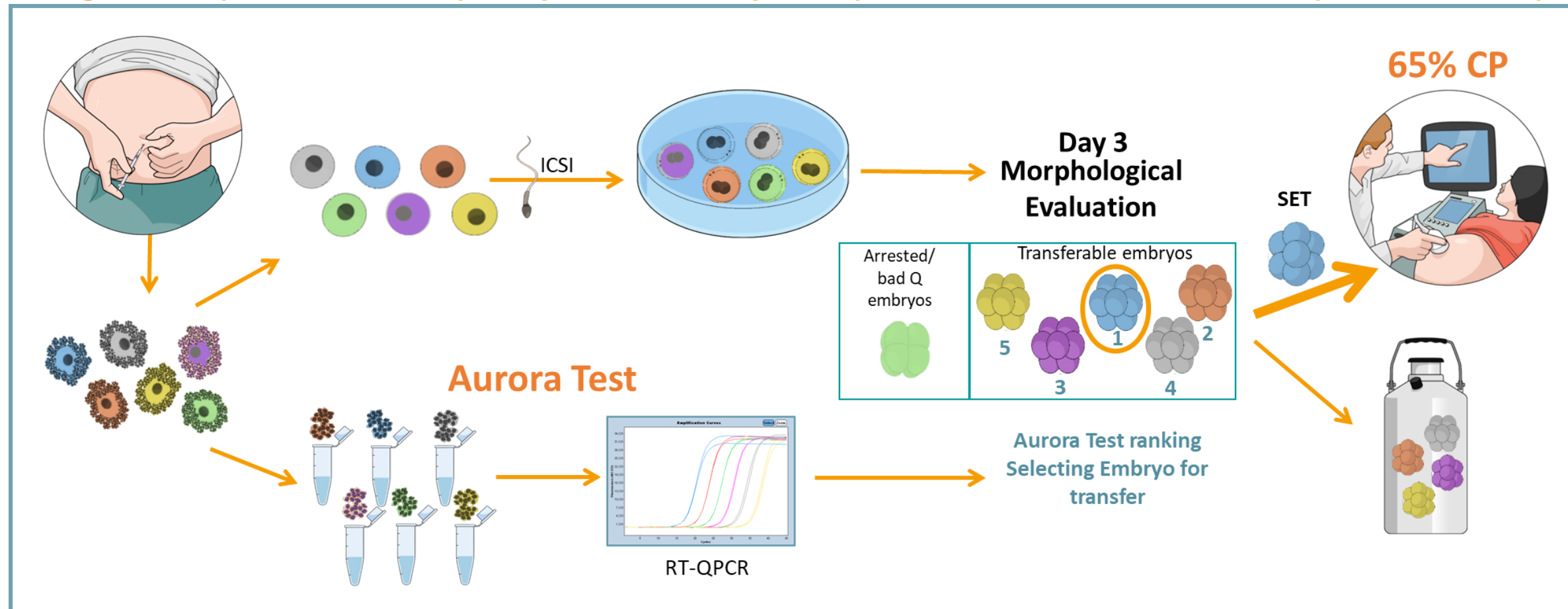


# Cumulus cell analysis as a non-invasive oocyte selection strategy to reduce the number of oocytes/embryos cultured and increase pregnancy rates

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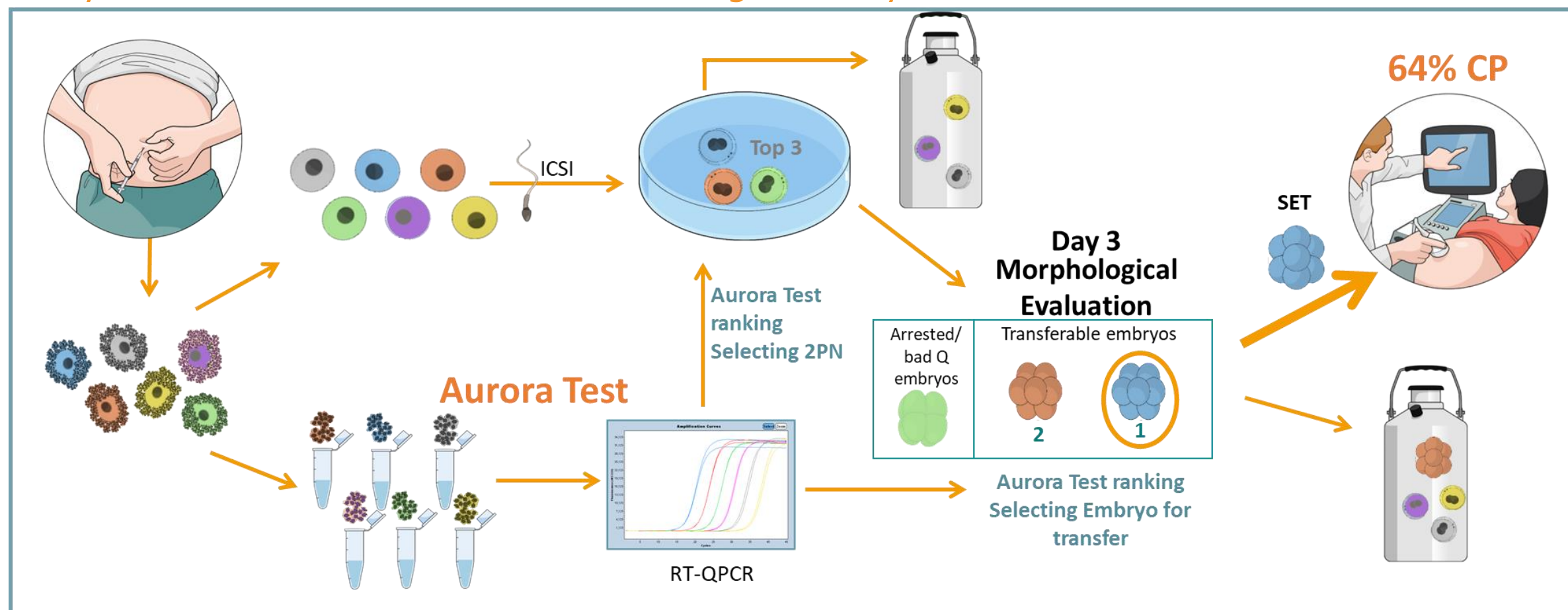
## What is known already

CC gene expression analysis (Aurora Test) is a predictor of the most competent embryo



## Study question

Can CC gene expression analysis by Aurora Test, prioritize a restricted number of oocytes for further culture and fresh single embryo transfer?



## Summary answer

CC analysis can be used for the selective processing of oocytes. This may reduce culture work and improve the outcome in ICSI elective SETs (eSET).

## Study design

In a retrospective analysis of *Van Vaerenbergh et al.* '21, it was investigated whether the Aurora Test, used to select transferable Day3-embryos, could also be applied to select oocytes on Day1, using a subset of 80 patients with on average 8 large preovulatory follicles on trigger day and at least 4 2PN oocytes. The effect of processing only the three highest ranked oocytes (by the Aurora Test) on embryo development and clinical pregnancy (CP) was studied and compared to processing all oocytes.

## Methods

Patients included in this single center study had their first or second GnRH-antagonist ICSI cycle, were younger than 40y, had normal BMI, were stimulated with HP-hMG and scheduled for Day3 eSET.

## Results

Processing only the three top-ranked oocytes (240/552 oocytes, 312 oocytes less to process) would have reduced the number of embryos to 171 GQE and would have resulted in 2.25 GQE on average on Day3 per patient; 76/80 (95%,ns) patients would have had a fresh Day3 transfer resulting in a 64% (ns) clinical pregnancy rate. Processing all 552 available 2PN oocytes (standard of care) resulted in a fresh Day3 transfer in all 80 patients and a similar 65% clinical pregnancy rate.

	Top 2 oocytes	Top 3 oocytes	All oocytes
2PN oocytes considered	160	240	552
GQE available Day3	121	171	411
% Patients with a fresh transfer (#)	89% (71)	95% <sup>ns</sup> (76)	100% <sup>ns</sup> (80)
% Clinical pregn./fresh transfer (#)	65% (46)	64% <sup>ns</sup> (49)	65% <sup>ns</sup> (52)
Fraction of the GQE frozen (#)	41% (50)	56%* (95)	81%* (331)
# of GQE frozen/patient with transfer	0,70	1,25	4,14
% Cumulative Pregn. considering all available oocytes/80 patients	84%	84%	84%

\*  $p < 0,05$ , 2-sided Fisher Exact test comparing Top3 or use all oocytes strategy; Patients  $n=80$ ; GQE: Good and Top-Quality Embryo based on Day 1-3 Morphology Evaluation.

## Limitations

The Aurora Test requires individual oocyte denudation. Restricting the number of oocytes to be grown to embryos requires oocyte vitrification. This new strategy should be validated in a prospective study.

## Conclusion & Wider implications

By performing the Aurora Test patients benefit from a high pregnancy rate in the fresh transfer cycle. The oocyte selection strategy results in a reduction of embryo culture and evaluation work because freeze/thawing and culture of embryos with lower competence would be prevented, while the extra freezing work is limited (+23%) due to the significantly lower number of supernumerary embryos generated. ART centers with limitations on embryo generation/freezing (e.g.: in Germany) might opt for the Top2 strategy as this further restricts the number of supernumerary embryos and offers similar pregnancy rates.