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REGION

Time-lapse recordings of developmental kinetics

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Improvements in the laboratory for increasing pregnancy rates

- Culture conditions:
  - Media
  - Dishes/plastics
  - Incubators: temp./CO_2
- Selection of embryos for transfer
- New kinetic markers for embryo quality

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Timelapse microscope

- Image recorded every 5th min.
- Stable CO_2
- Stable temp

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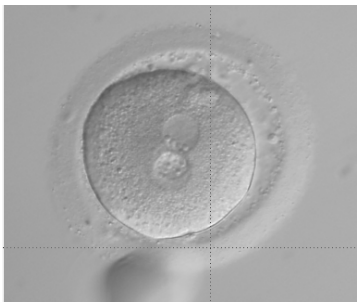
Timelapse incubator – startup tests



- 3PN oocytes

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Time-lapse study with 2PN-fertilised oocytes

- In total 102 2PN-oocytes studied by time-lapse
- From day 1 (between 9-11) until day 2 (8.00)
- Both IVF and ICSI fertilised oocytes

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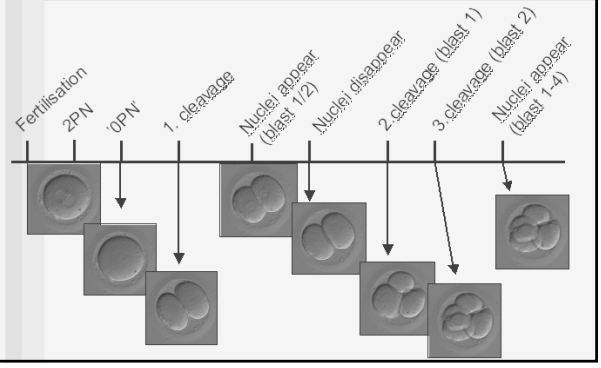
Timespan of study with 2PN-fertilised oocytes



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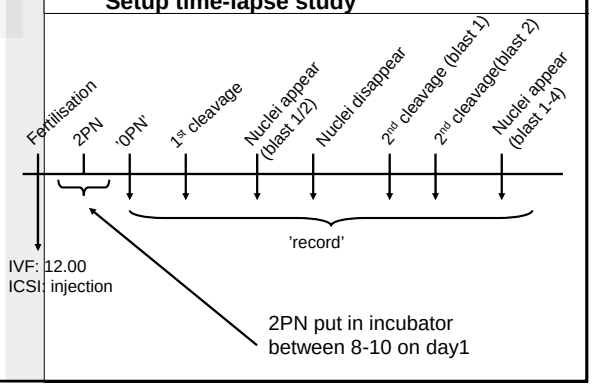
Setup time-lapse study



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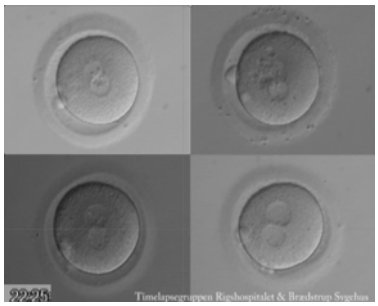
Various 2PN-oocytes synchronised



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Time-lapse study with 2PN-fertilised oocytes

	Timelapse	Sibling oocytes
No. 2PN-embryos	102	617
Not divided	4 (4%)	29 (5%)
2-cells	27 (26%)	120 (19%)
3-cells	12 (12%)	64 (10%)
4-cells	53 (52%)	344 (56%)
5+-cells	6 (6%)	60 (10%)
Transferred or frozen ('good quality')	84 (82%)	499 (81%)

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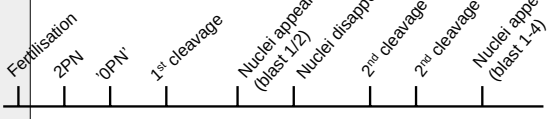
2PN study results I



average		25,2	28,0	31,3	37,0	39	39,1	40,1 hrs
~8.30 day 2:								
2 cells	28,5	31,5	35,4					
3 cells	26,5	29,5	33,1	38,5	40,5			
4 cells	24,3	26,6	30,2	36,8	40,5	41,3		
>4 cells	22,5	25,1	27,5	36,1	38,2	38,4		

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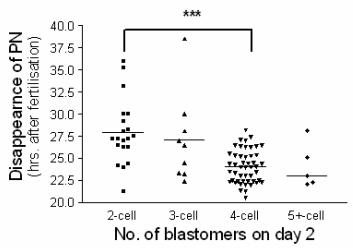
2PN study results II

Timepoint for disappearance of pronuclei is dependent on the number of blastomers on day2



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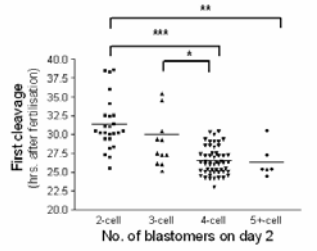
2PN study results III

Timepoint for first cleavage is dependent on the number of blastomers on day 2



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Time-lapse study with 2PN-fertilised oocytes pregnancy vs. not

- In total 29 of the time-lapse embryos were transferred
- Of these 17 were 4-cell embryos in eSET

- The two groups were not different according to:
  - Fertilisation type (33% vs 23% ICSI)
  - Early cleavage (25,6 vs 26,4 hrs.)
  - Fragmentation grade 0/1 (50/50% vs 69/41%)
  - Female age (33,0 vs 33,2)

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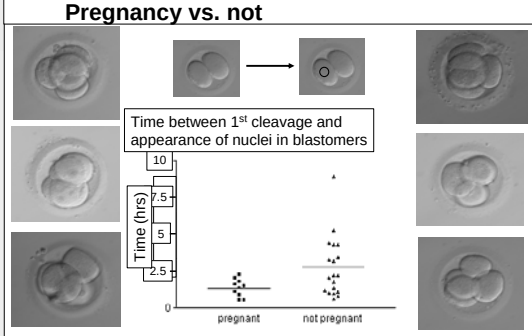
Pregnancy vs. not



After 1st cleavage the nuclei appear faster

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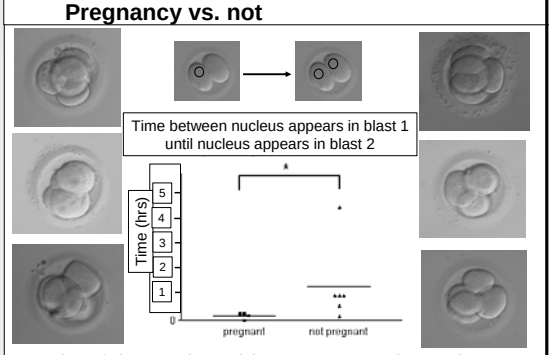
Pregnancy vs. not



After 1st cleavage the nuclei appear more synchronously
In the embryos leading to a pregnancy

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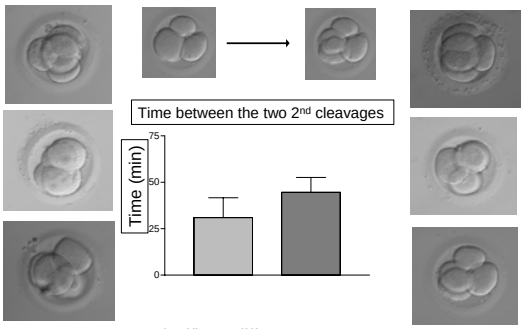
Pregnany vs. not



No significant difference

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Embryo leading to pregnancy

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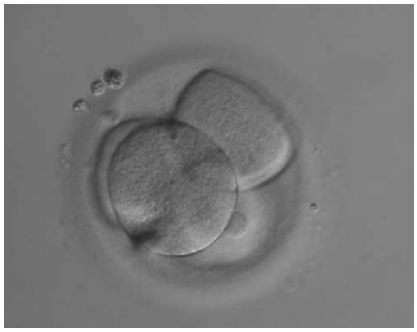
Embryo not leading to pregnancy



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Will this one give a pregnancy?

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Will this one give a pregnancy?

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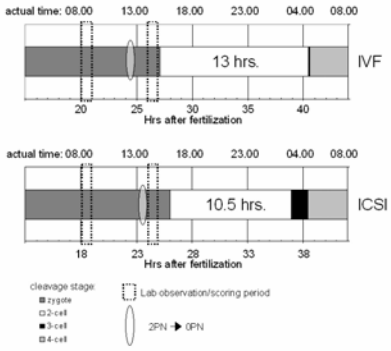
Differences between IVF & ICSI



- First cleavage
- Time as '2-cell'
- Time as '3-cell'

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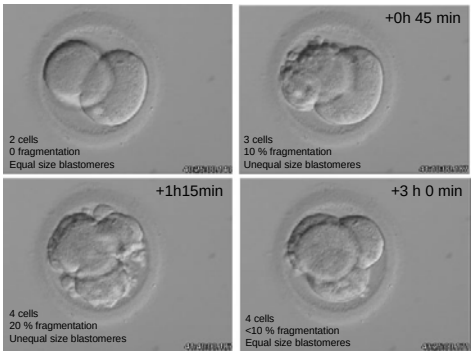
Kinetics in cellular divisions



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Timelapse study with 2PN-oocytes - conclusions

Potential morphologic markers for embryo quality?

Embryos leading to a pregnancy:

- After 1st division the nuclei appear quicker
- After 1st division the nuclei appear more synchronously in the two blastomers
- Timing of fertilisation in comparison to scoring-timepoint is important, and could mean that top-quality embryos are scored poorly
- There is a difference between IVF and ICSI fertilised embryos in their '2-cell period'

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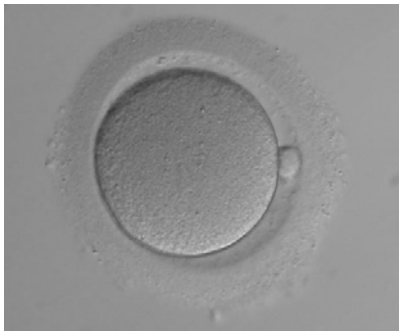
ICSI-oocyte just after injection



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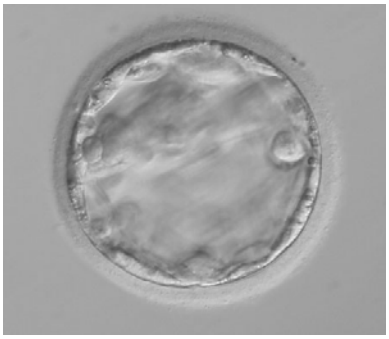
Blastocyst



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Blastocyst