

## Influence of release pad impregnation on latex conjugate release

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# UNISART lateral flow membranes - consistency by design

## Objective

=> To identify release pad impregnation conditions that ensure quantitative conjugate release as well as membrane blocking „on the fly“

## Method

- => Impregnation buffer components are systematically varied
- => release, background, as well as test and control line intensity are quantified
- => statistical evaluation of the results (Design of Experiment)
- => detailed study of main factor(s)

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Factors for screening experiment:

Factor	Buffer Molarity [mMol]	Tween 20 Conc. [%]	BSA Conc. [%]	Succrose Conc. [%]
high	200	0,5	2	3
low	10	0,01	0	0

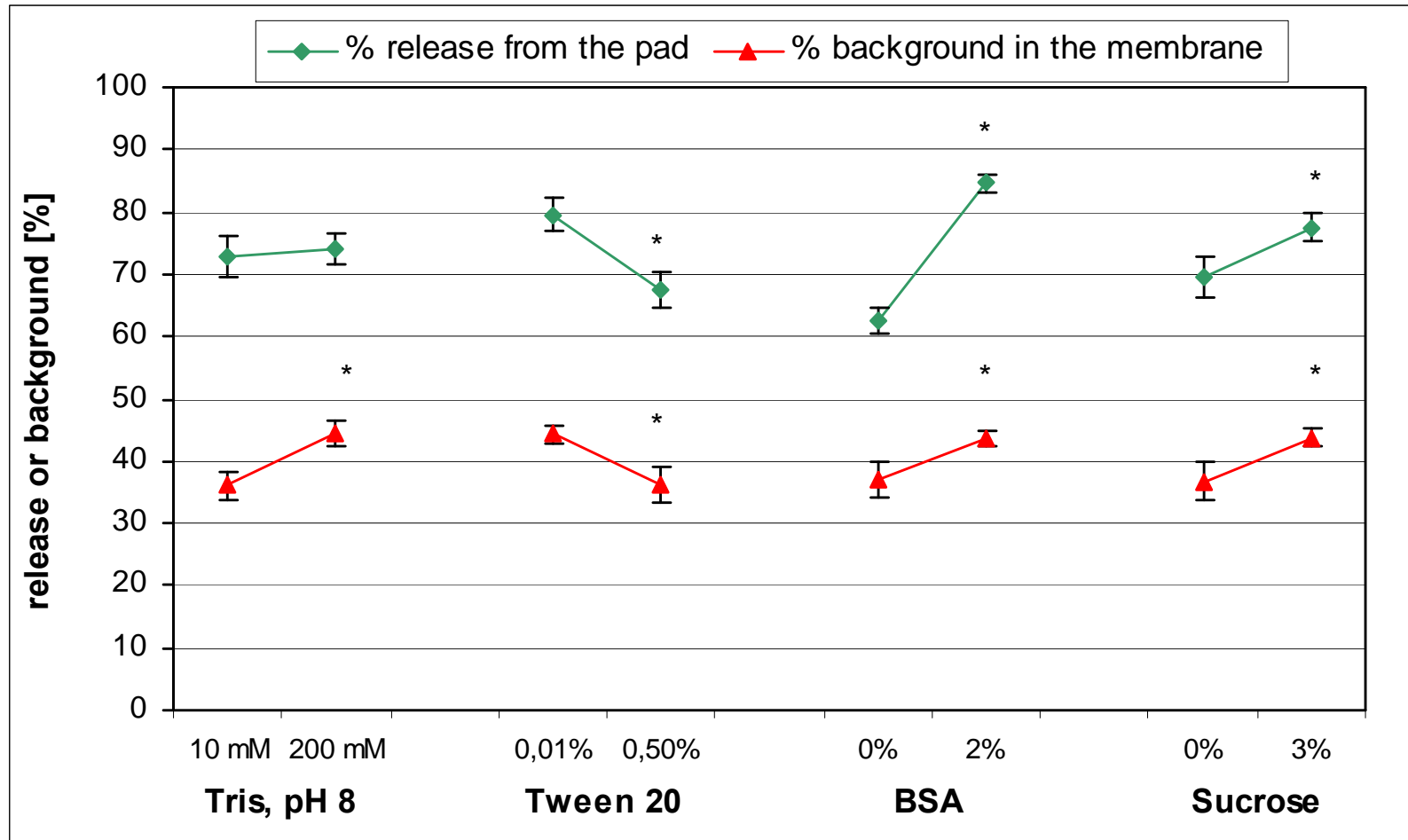
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## Experimental procedure:

1. Soak release pad with different buffer mixtures  
=> dry @20°C for at least 4 hours
2. Add conjugate particles to release pad  
=> dry @20°C for 4 hours
3. Build hCG test strips
4. Evaluate performance during the run:  
=> observe running time and flow front separation
5. Evaluate performance on the dry strip:  
=> scan dry strips and use image analysis tools to quantify conjugate release, background, and line intensity
6. Use statistical evaluation program to identify main factors and interactions (Design of Experiment)

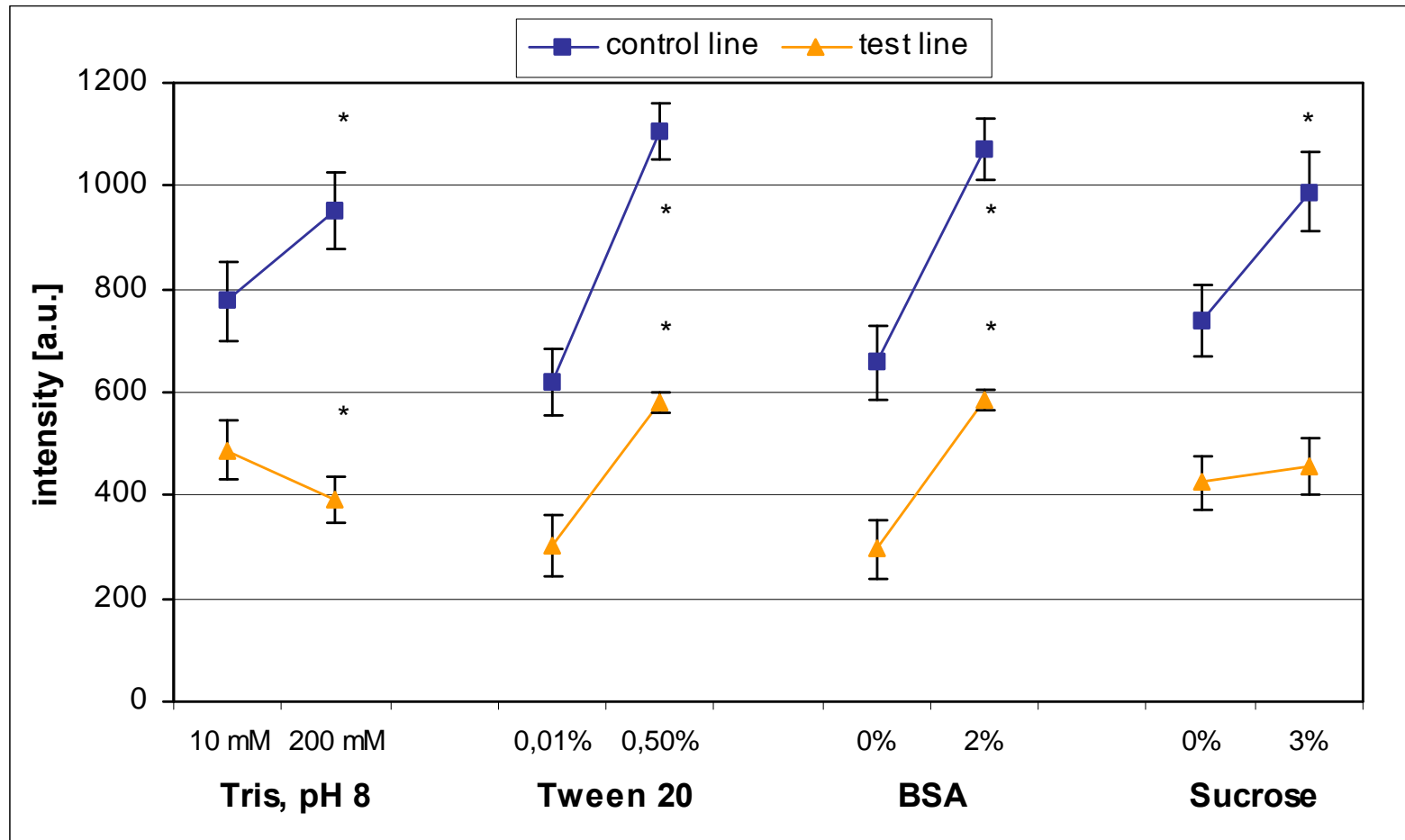
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## Main effects plot for release and background



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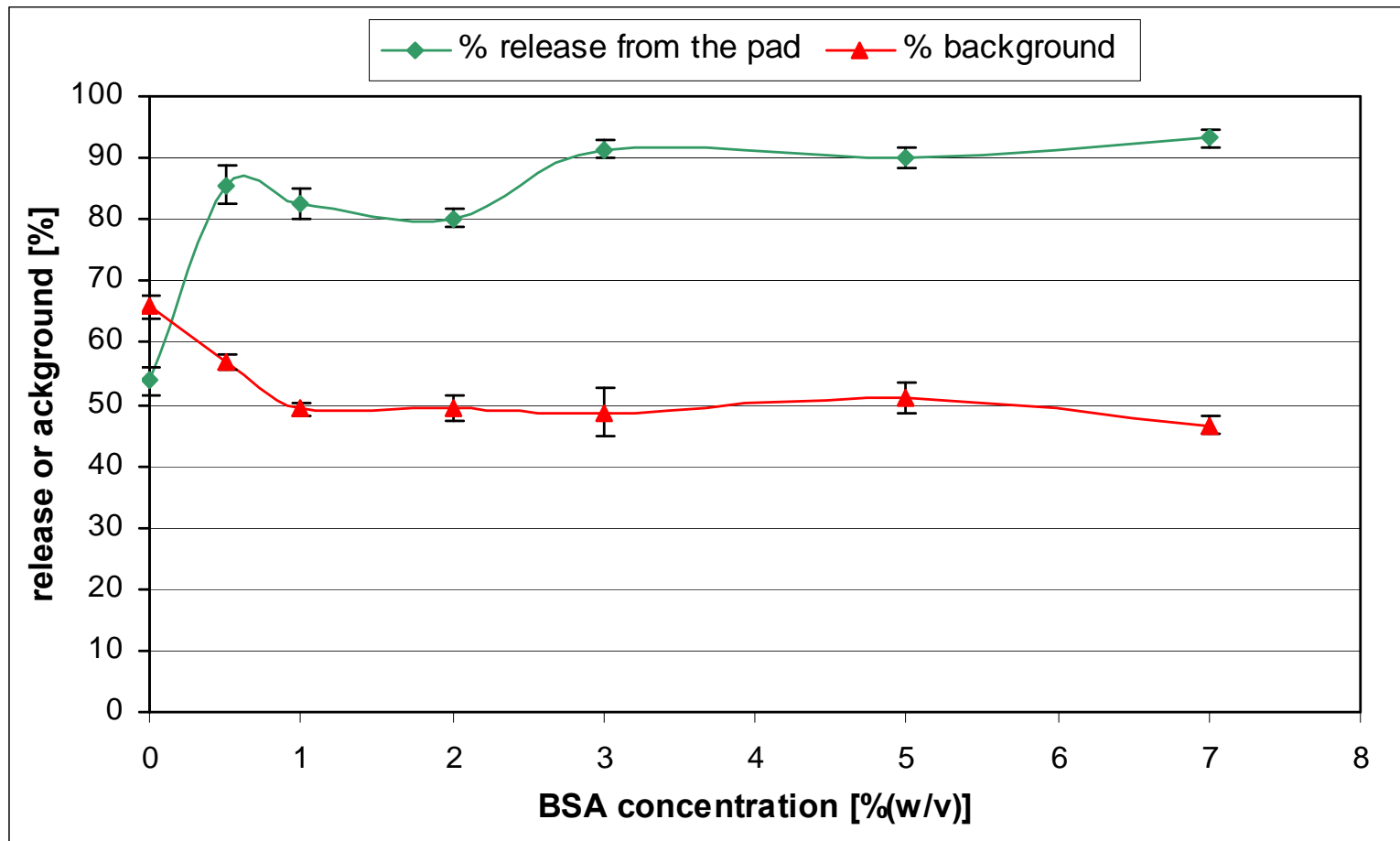
## Main effects plot for test- and control-line intensity



## Influence of BSA (detailed investigation)

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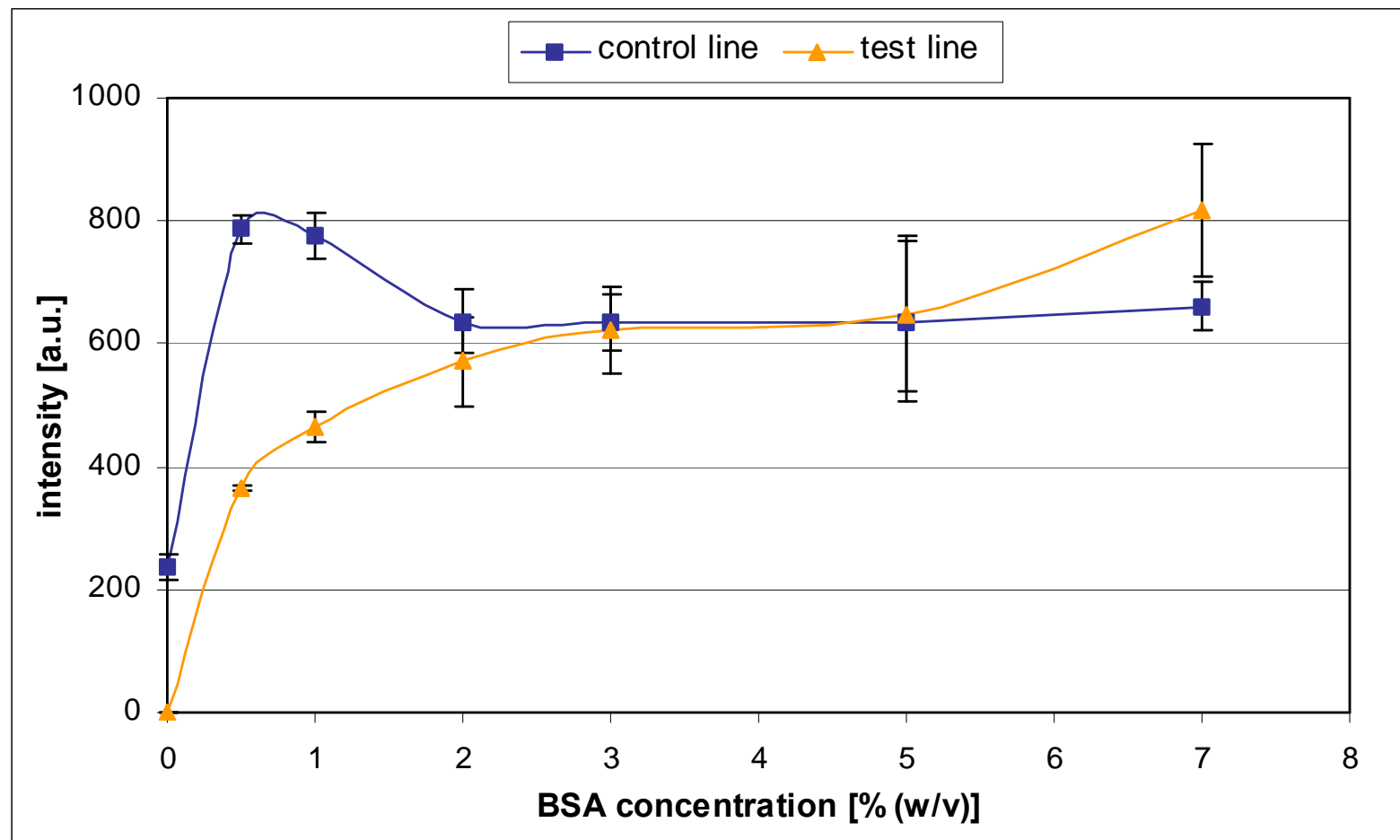
## Influence of BSA on release and background





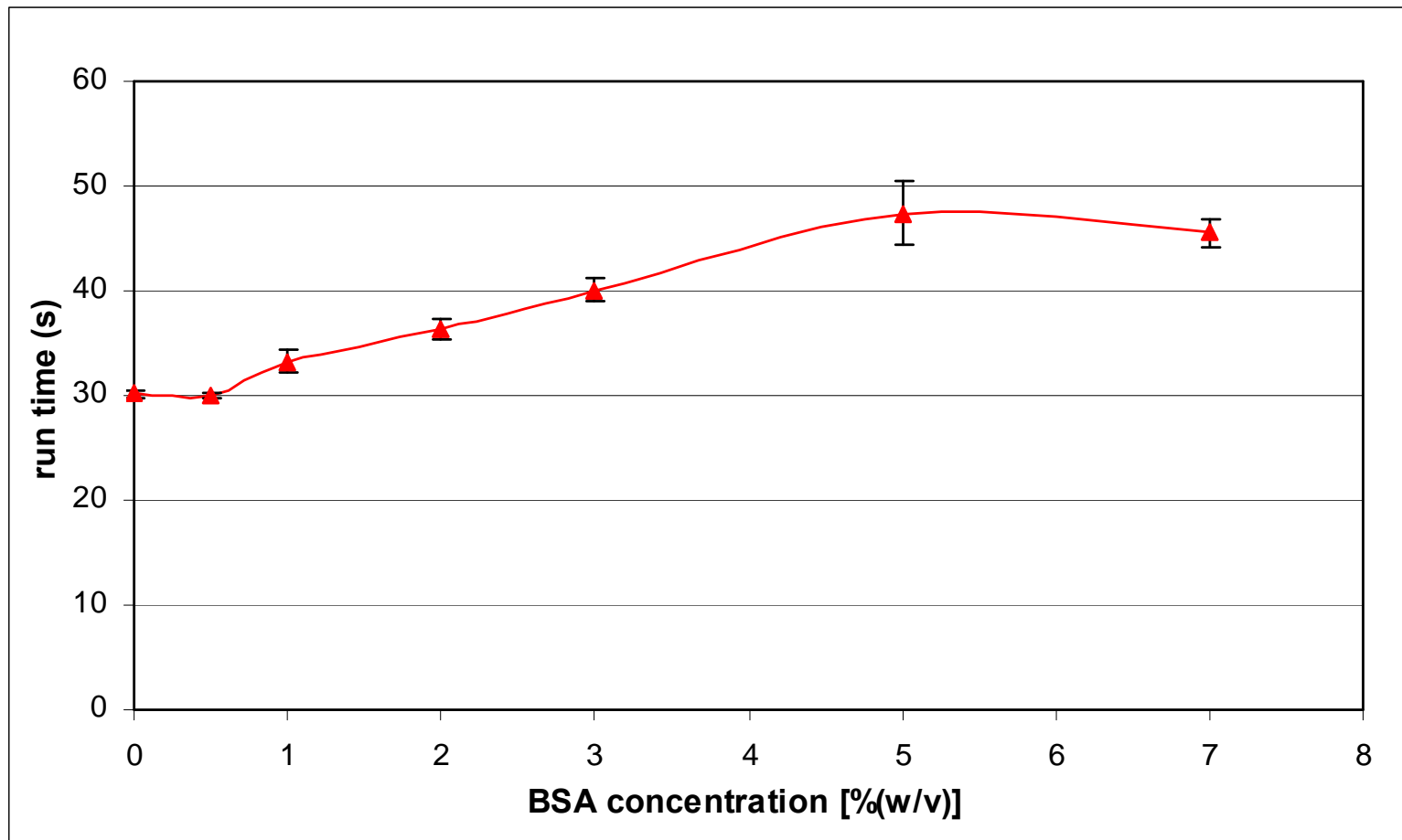
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## Influence of BSA on test- and control-line intensity



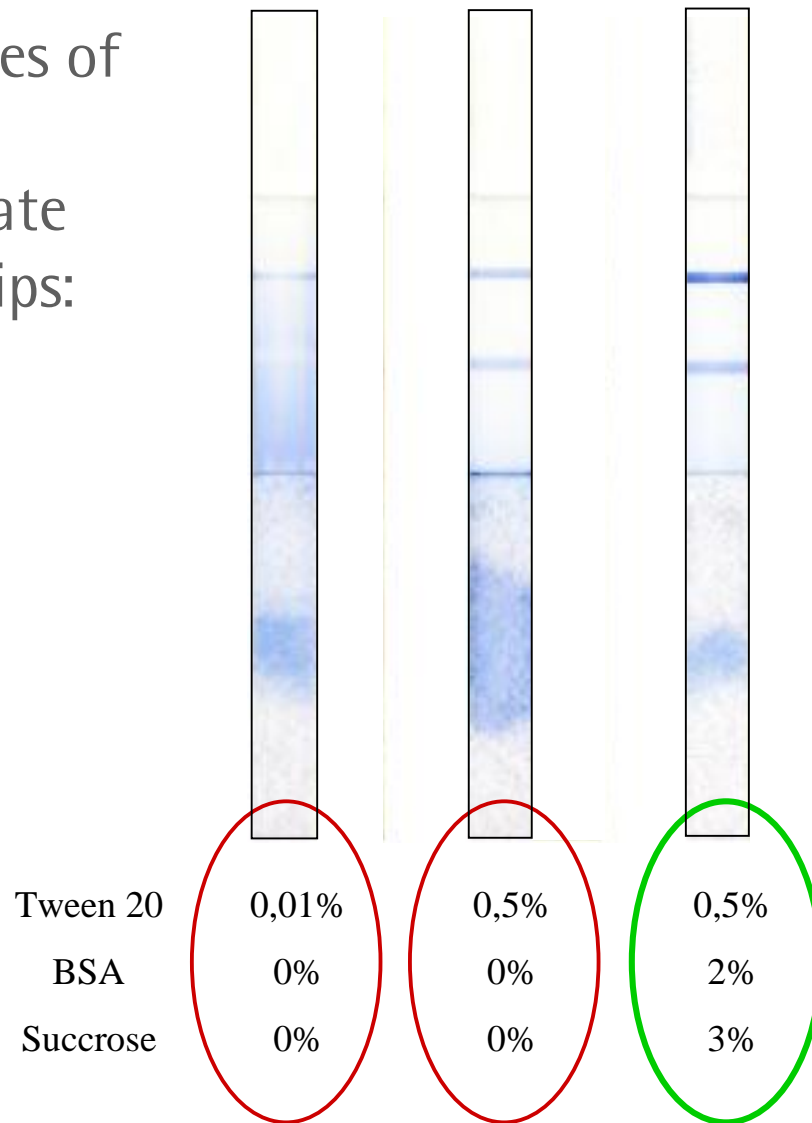
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## Influence of BSA on running time



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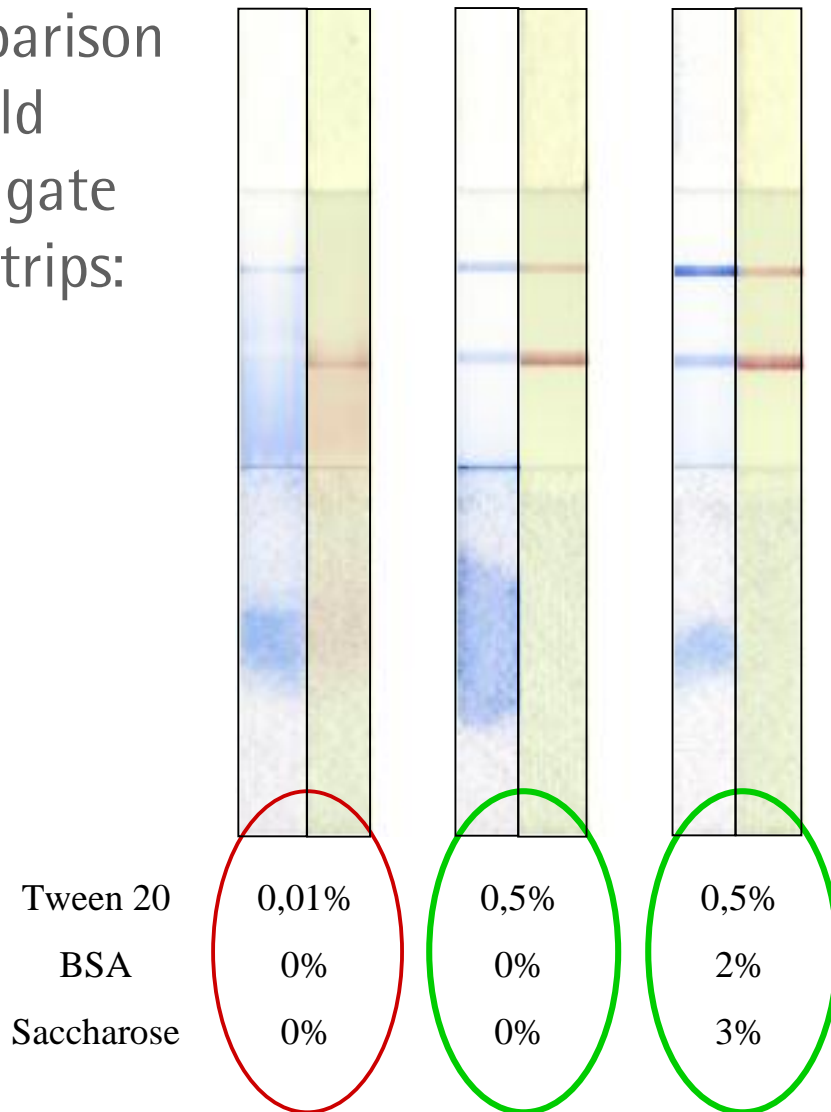
Examples of latex conjugate test strips:



=> good latex conjugate release and low background only for impregnation with high BSA and high succrose. Tween 20 alone is not sufficient.

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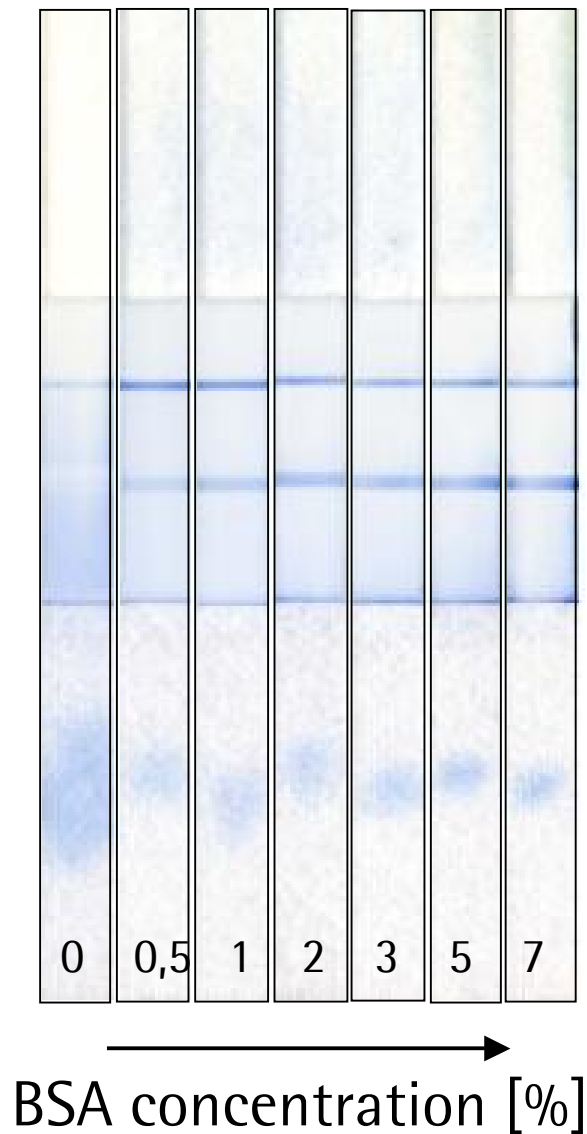
Comparison to gold conjugate test strips:



=> good gold conjugate release already at through addition of Tween 20. BSA and succrose nor mandatory for efficient release and low background.

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Dry strips

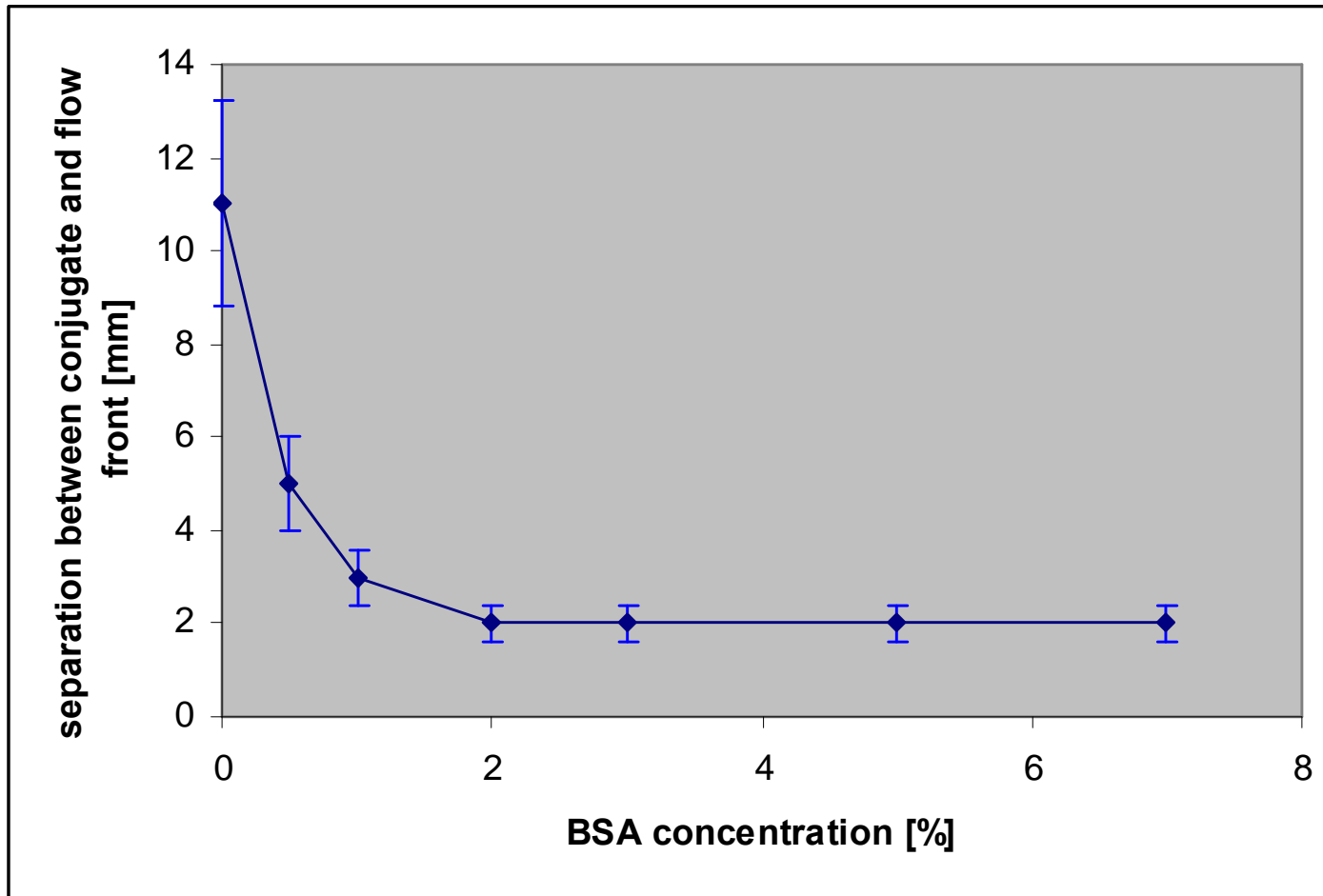


=> Low test line intensity for low BSA concentration

Hypothesis:  
Analyte is faster than conjugate particles and blocks antibody before conjugate arrives at test line.

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## Influence of BSA on flow front separation



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ABON, Hangzhou, 21.06.2006

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