

# The role of discretization in modeling signal transduction networks

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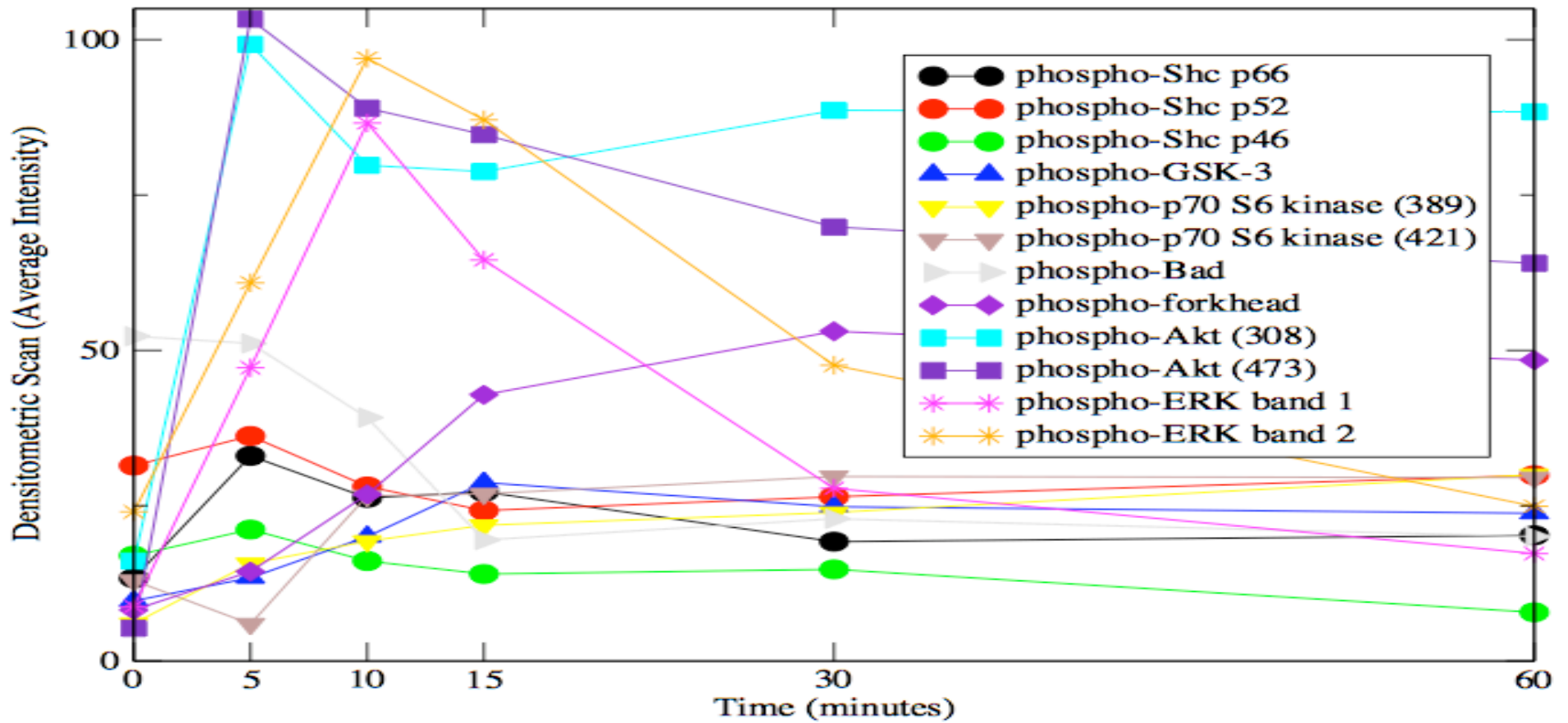
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## Proteomic Modification Modeling using Computational Algebra and Game Theory

- Time series data of protein modifications (number of time points is small)
- Cotemporal relationships
- LaGrange interpolation over a finite field
- Simplification of polynomials via Groebner Basis
- Determination of influences via Deegan-Packel index of power
- Allen et al, *Algebraic dependency models of protein signal transduction networks from time-series data*, **JTB**, 238 (2006), 317-330.

# Chondrocyte Data



# Chondrocyte Discretizations

## Above/Below Mean, Chi Merge 3, Kmeans 3, Kmedoids 3

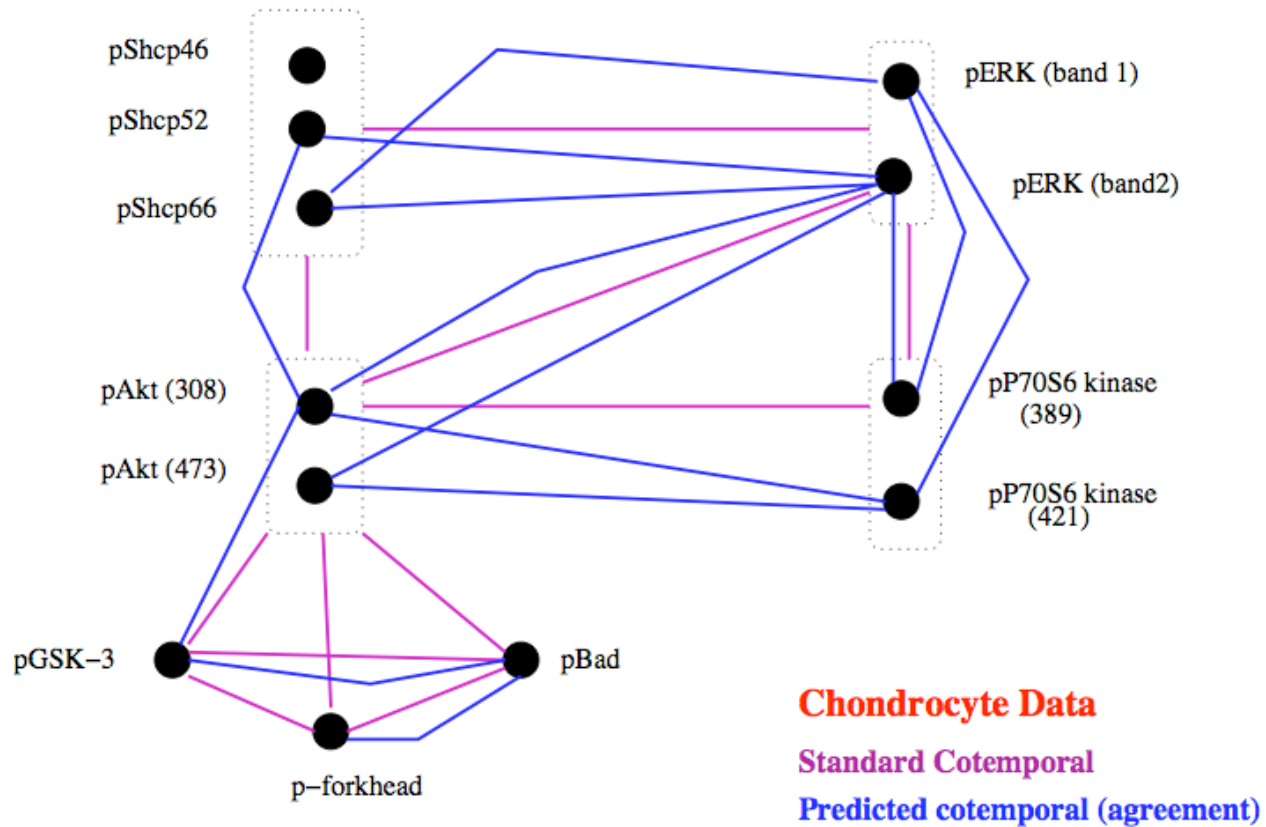
Protein	0	5	10	15	30	60
pShc P66	0	1	1	1	0	0
pShc P52	1	1	0	0	0	1
pShc P46	1	1	1	0	0	0
pERK band1	0	1	1	1	0	0
pERK band2	0	1	1	1	1	0
pAkt (308)	0	1	1	1	1	1
pAkt (473)	0	1	1	1	1	0
pP70S6 kinase (389)	0	0	0	1	1	1
pP70S6 kinase (421)	0	0	1	1	1	1
pGSK-3	0	0	0	1	1	1
p-forkhead	0	0	0	1	1	1
pBad	1	1	1	0	0	0

Protein	0	5	10	15	30	60
pShc P66	0	2	2	2	1	1
pShc P52	1	2	0	0	0	1
pShc P46	1	2	1	1	1	0
pERK band1	0	1	2	1	0	0
pERK band2	0	1	2	2	1	0
pAkt (308)	0	2	1	1	2	2
pAkt (473)	0	2	2	2	1	1
pP70S6 kinase (389)	0	1	1	2	2	2
pP70S6 kinase (421)	1	0	2	2	2	2
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# Chondrocyte Cotemporal Model



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# Thanks

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