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Project Title	Molecular mechanisms underlying eukaryotic chromosome segregation
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Report

We found that PLK1 recruitment by RSF1 at centromeres creates an activating phosphorylation on Thr236 in the activation loop of Aurora B and this is indispensable for the Aurora B activation. In structural modeling the phosphorylated Thr236 enhances the base-catalysis by Asp200 nearby, facilitating the Thr232 autophosphorylation. Accordingly, RSF1-PLK1 is central for Aurora B-mediated microtubule destabilization in error correction. However, under full microtubule-kinetochore attachment RSF1-PLK1 positions at kinetochores, halts activating Aurora B and phosphorylates BubR1, regardless of tension. Spatial movement of RSF1-PLK1 to kinetochores is triggered by Aurora B-mediated phosphorylation of centromeric histone H3 on Ser28. We propose a regulatory RSF1-PLK1 axis that spatiotemporally controls on/off switch on Aurora B. This feedback circuit among RSF1-PLK1-Aurora B may coordinate dynamic microtubule-kinetochore attachment in early mitosis when full tension yet to be generated.