Supplementary Figures Legend

Supp. Figure 1 : Heatmap representing the variation in the abundance of proteins identified in the secretomes of rostral, Lesion and caudal segments after 12 h to 10 days of Spinal cord injury (SCI).

Supp. Figure 2 : **A**) Sequence alignment between the two isoforms of Heimdall. Blue boxes represent the amino acid residues the most different between the two proteins. B) MS/MS spectra corresponding to the two sequences highlighted with blue boxes

Supp. Figure 3 : IgBlast [98] analyses of Heimdall sequence confirming its homology with the variable Kappa chain. Heimdall sequence contains a signal peptide leading to its secretion

Supp. Figure 4 : **A)** To validate the specificity of anti-Heimdall, western blot analyses in reducing and denaturating conditions were carried out on protein cell extracts from DI TNC1 astrocytes stimulated or not with 200 ng/mL of LPS for 24 h with anti-Heimdall pre-incubated or not with the peptides used for the immunization. A control with the secondary antibody alone was also added as awell as the preimmune serum. **B)** Western blot experiments in reducing and denaturing conditions using anti-Heimdall were performed on protein cell extracts from DI TNC1 cells or primary cortex astrocytes stimulated or not with 200 ng/mL of LPS for 24 h and 48 h. Localization of the IgKV, IgHV, IgH chains identified by MS/MS are flagged by an arrow **C)** Western blot analyses with anti-Heimdall performed on the secretomes of DI TNC1 Astrocytes treated or not with LPS in reducing and denaturing conditions (n=3)

Supp. Figure 5 : Third long non coding RNA (AABR07065780.1) encoding a protein (IP_1282467.1) related to variable heavy chain. IGMT [99] analyses confirm the homology of this Alternative protein with the somatic IGHV11-8*01.

Supp. Figure 6 : Heatmap represents the Ghost proteins related to IGVH and identified at Lesion segment 12 h after SCI and RhoAi treatment.

Supp. Figure 7 : String analysis of the specific proteins identified from DI TNC1 astrocytes cell line treated with anti-Heimdall.

Supp. Figure 8 : Western blot experiments in non-reducing and denaturating conditions using anti-Heimdall were performed on protein cell extracts from DI TNC1 cells stimulated or not with 200 ng/mL of LPS for 24 h and compared to *Heimdall* KO cells.

Supp. Figure 9 : A) Reactome analysis of specific proteins found in *Heimdall* KO DI TNC1 astrocytes. **B)** Western blot experiments in reducing and denaturing conditions using anti-Notch2 were performed on protein cell extracts from DI TNC1 *Heimdall* KO cells stimulated or not with 200 ng/mL of LPS for 24 h.

Supp. Figure10 : A) Venn diagram and **B)** Heatmap comparison between DI TNC1 cells overexpressing Heimdall, DI TNC1 cells infected with the empty vectorand DI TNC1 control cells **C**) a)Heatmap construct based on the comparison between *Heimdall* KO DI TNC1 cells DI TNC1 cells incubated with anti-Heimdall and DI TNC1 cells overexpressing Heimdall. Systemic biology analyses of the two Clusters (1,2) are presented in b and c.