Electronic Supplementary Information (ESI)

NIR-II Window Tracking of Hyperglycemia Induced Intracerebral Hemorrhage in Cerebral Cavernous Malformation Deficient Mice

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Table S1. Gaussian fitting parameters obtained after mono, bi- and tri- exponential fitting to fluorescence spectrum of Ag_2S QDs under 808 nm excitation and emission collected between 950–1700 nm using the following equation. To fit Gaussian distribution Curve fitting Tool box from MATLAB R2020a is used by employing following equation (i=1,2, and 3 corresponds to mono, bi-, and tri- exponential Gaussian fitting, where P(i) = Peak position, W(i) = Peak width, and with goodness of fit R^2).

$$\text{Gaussian (i)} = \sum_{i=1}^{i=3} A(i) * e^{\frac{-(x-P(i))}{W(i)^2}}$$

Fitting	A1	P1	W1	A2	P2	W2	A3	P3	W3	R^2
Gaussian 1	11900	1135	171							0.9823
Gaussian 2	4261	1213	212	8970	1110	129				0.9984
Gaussian 3	158	1125	3.3	4221	1214	211	9018	1109	129.5	0.9984

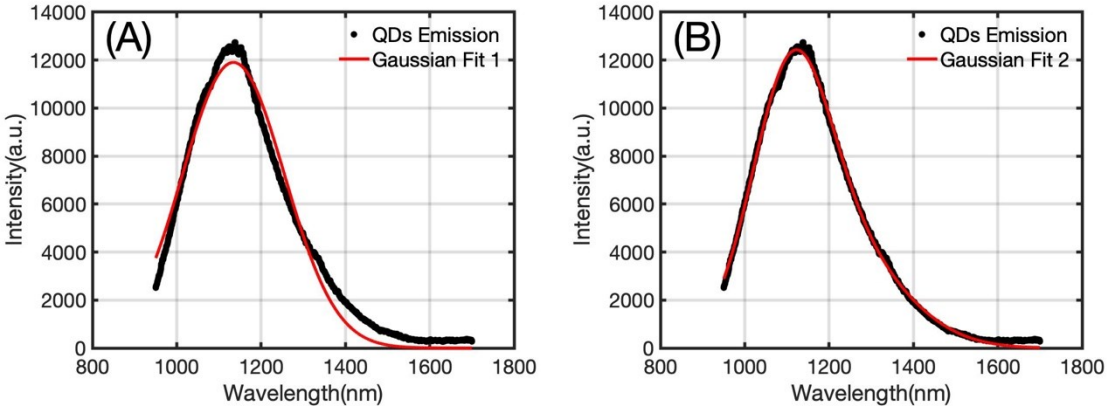

Fig. S1. (A) Mono exponential (R^2 = 0.9823), (B) Bi- exponential (R^2 = 0.9984) Gaussian peak fitting to Ag_2S emission spectrum between 950–1700 nm. Fitting parameters are depicted in Table S1. There has not been significant improvement using Gaussian 3 fitting (no change in R^2 was observed)

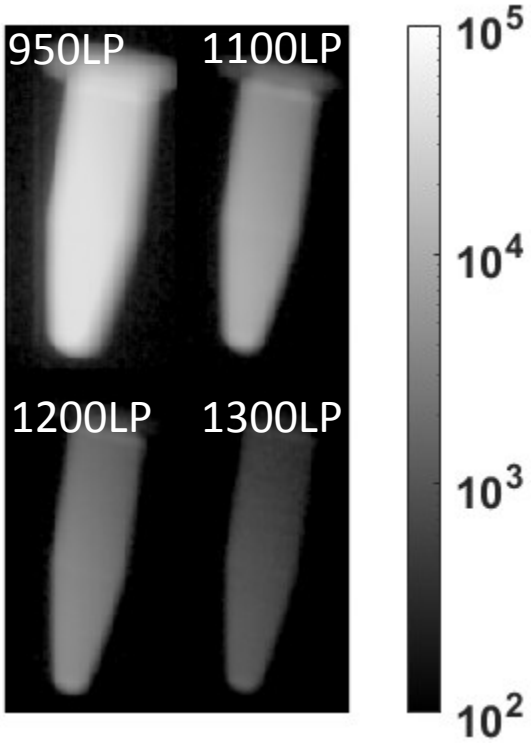

Fig. S2. Vial of QDs excited with 5 mW/cm^2 and 10 ms exposure with sequentially longer cut-off wavelength long-pass filters.

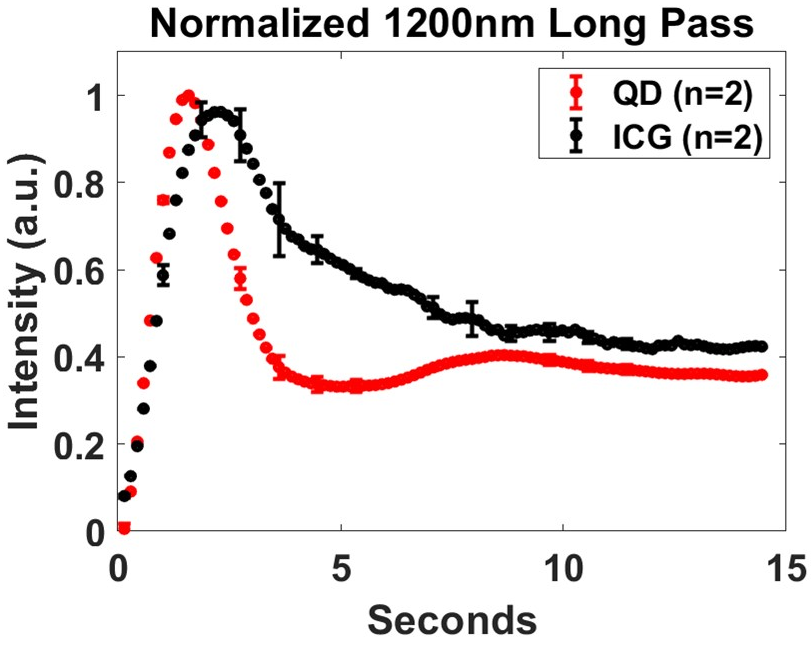

Fig. S3. Dynamic mean NIR-II intensity from brain in from mice injected with QDs and ICG under 1200 nm longpass filter (excitation = 808 nm (17 mW/cm^2), exposure = 100 ms).

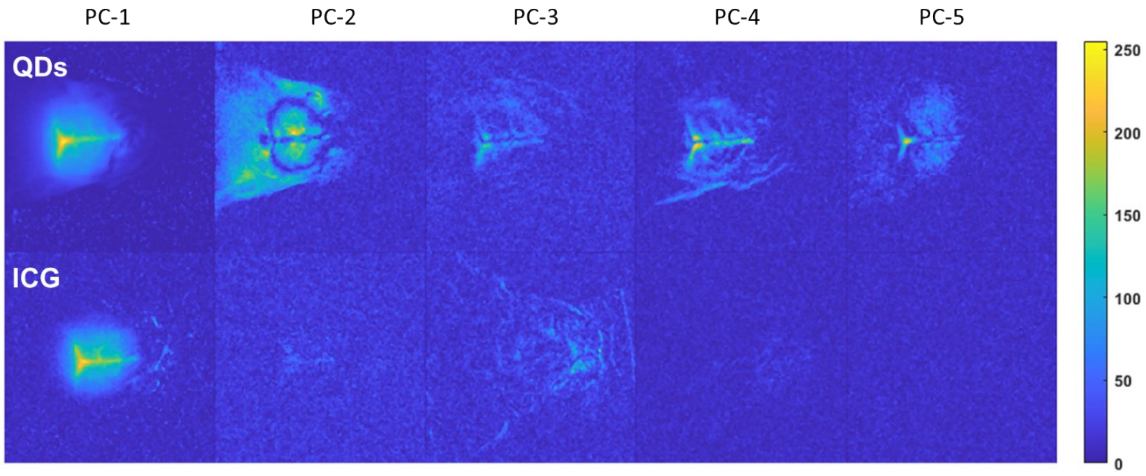

Fig. S4. Contribution of first five PCs image patterns from mice injected with QDs and ICG under 1200 nm longpass filter (excitation = 808 nm (20 mW/cm^2), exposure = 100 ms).

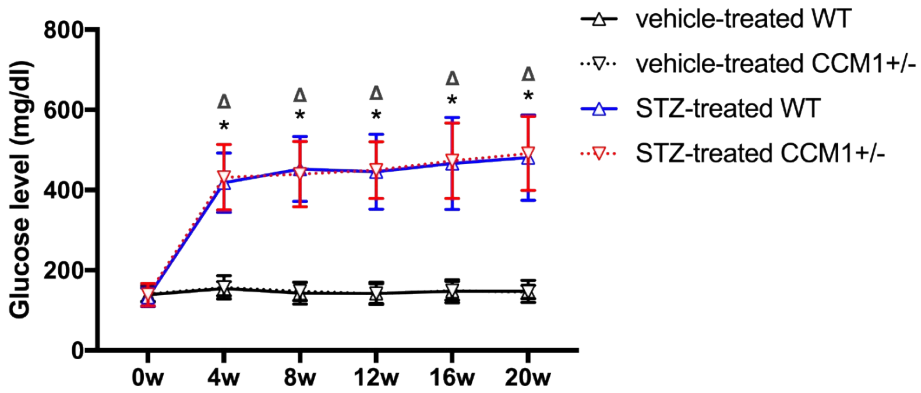

Fig. S5. Glucose level of mice. After 5 days consecutively administration of low dose streptozotocin (STZ), both wild type and Ccm1+/- mice glucose level reached diabetes criteria (> 250 mg/dl). However, the glucose level of those mice receiving the vehicle control remains around the basal line and there is no significant difference between vehicle-treated CCM1+/- group and vehicle-treated WT group. Δp<0.0001, STZ-treated CCM1+/- group vs. vehicle-treated CCM1+/- group, *p<0.0001, STZ-treated WT group vs. vehicle-treated WT group.

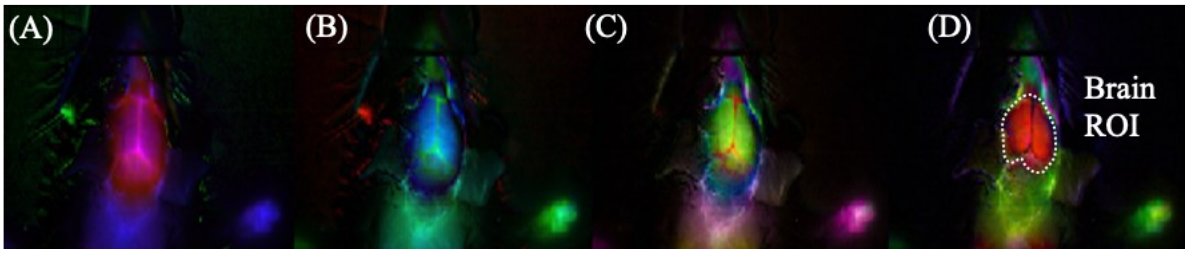

Fig. S6. Principal component analysis (PCA) of a typical mice brain for the segmentation of brain outline, whole dynamic fluorescence intensity data analyzed by applying singular value decomposition algorithm. These colour coded images corresponds to its merged first three principal component, (A) PCA overlay of 1,2, and 3rd, (B) PCA overlay of 2,3, and 4rd, (C) PCA overlay of 3,4, and 5th, and (D) PCA overlay of 4,5, and 6th principal components.

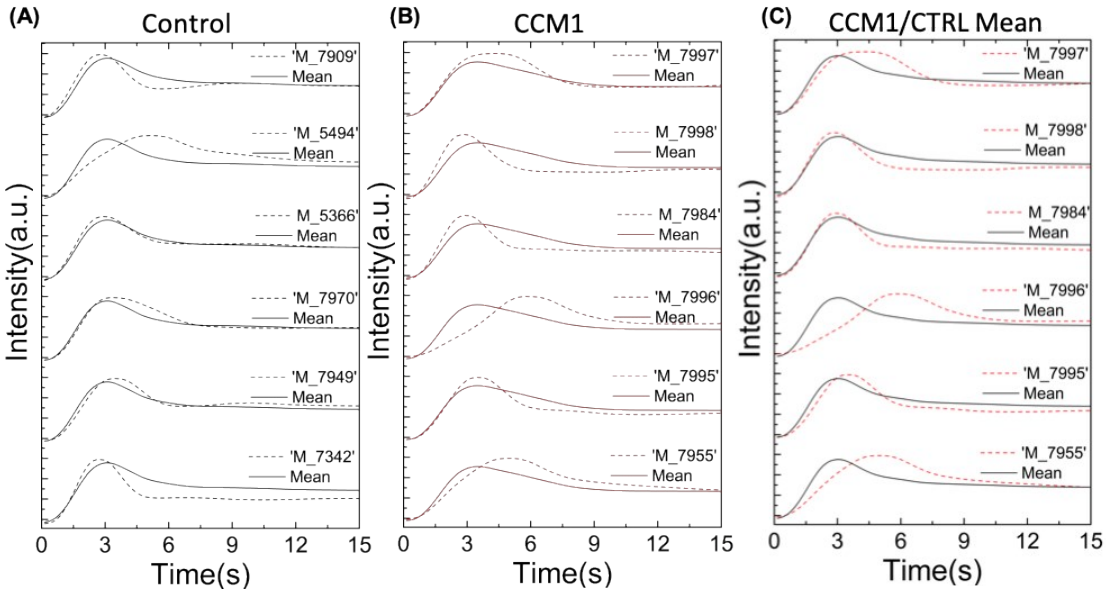

Fig. S7. Dynamic mean NIR-II intensity from brain in (A) Control, (B) CCM1 group mice, where mean from six animals from each group itself, whereas (C) CCM1 group plotted with control mean.

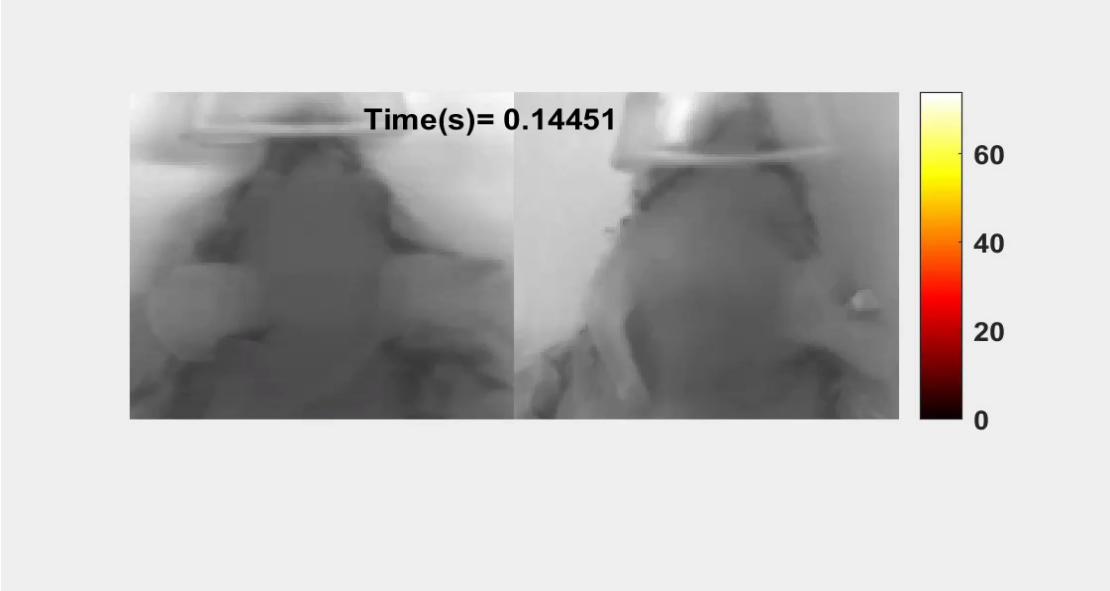

Fig. S8. **Realtime movie of dynamic noninvasive fluorescence imaging in NIR-II window**: Mouse brain of control (left) and CCM1 +/– (right) group mice on tail vein injection of PEGylated Ag_2S QDs, 808 nm (20 mW/cm^2) light excitation, 100 ms exposure, using an InGaAs camera with 950-nm longpass filter. Please check link https://figshare.com/s/d2ffba8c9d87b006b972 to watch this movie (DOI: 10.6084/m9.figshare.12672389).