Targeted imaging of lysosome and endoplasmic reticulum and their pH monitoring with surface regulated carbon dots

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Electronic Supplementary Information Included:

1. Supplemental tables and figures

Figure S1. FT-IR spectra of ACDs and LCDs.

Figure S2. The contact angles of ACDs, LCDs-5, LCDs-10, LCDs-15, LCDs-20.

Figure S3. . The pH responsive features of LCDs-5 (A), LCDs-10 (B), LCDs-15 (C), LCDs-20 (D) and the corresponding linear curves.

Figure S4. Normalized fluorescence intensity of ACDs at pH 5.00 (A and B) and LCDs at pH 7.00 (C and D) in the presence of various metal ions, anion and amino acid (Concentration: 0.05 mM for Fe^{3+}, Cu^{2+} and Al^{3+}; 1.0 mM for others); Conditions: Ex/Em=350/440 nm for ACDs; Ex/Em=360/430 nm for LCDs.

Figure S5. Fluorescence reversibility of ACDs (A) with pH values changing between 4.0 and 7.0, and LCDs (B) with pH values changing between 5.0 and 9.0. Conditions: Ex/Em=350/440 nm for ACDs; Ex/Em=360/430 nm for LCDs.

Figure S6. Normalized fluorescence intensity of ACDs (A) and LCDs (B) under irradiation of xenon lamp (150 W) for 2 h. Conditions: Ex/Em=350/440 nm for ACDs; Ex/Em=360/430 nm for LCDs.

Figure S7. Cytotoxicity of ACDs (A) and LCDs (B) in MCF-7 cells.

Figure S8. CLSM images of MCF-7 cells after culture with 0.30 mg mL^{-1} ACDs (A) and 0.04 mg mL^{-1} LCDs (B) at different culture time. Observation conditions: blue fluorescence channel, Ex/Em: 405/420–500 nm for ACDs and LCDs.

Figure S9. CLSM images of MCF-7 cells co-cultured with ACDs (A), LCDs (B) and different pathway inhibitors.

Figure S10. Normalized optical density of MCF-7 cells cultured with ACDs simulated with chloroquine and LCDs treated with dexamethasone.

Table S1. The pH response of the CDs prepared with different amount of laurylamine.

Table S2. The correlation coefficient of ACDs and LCDs with different organelle probe.

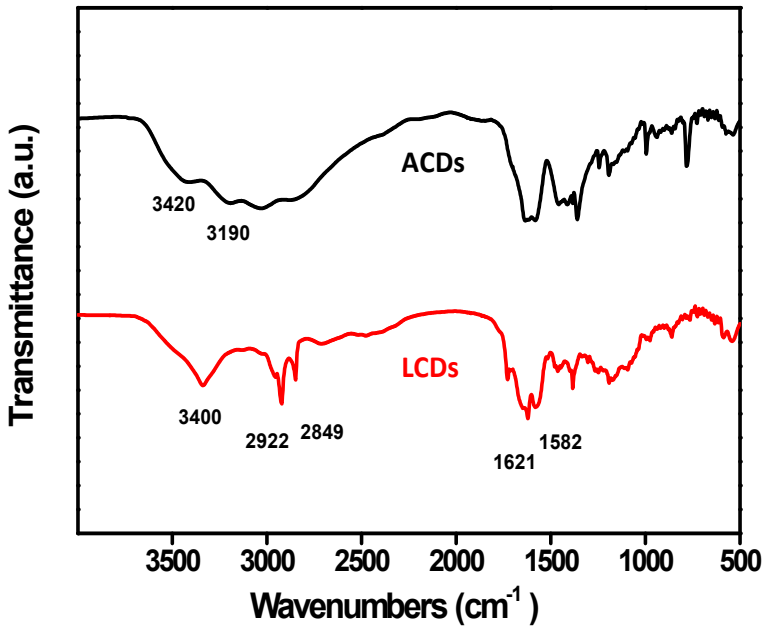


Figure S1. FT-IR spectra of ACDs and LCDs.

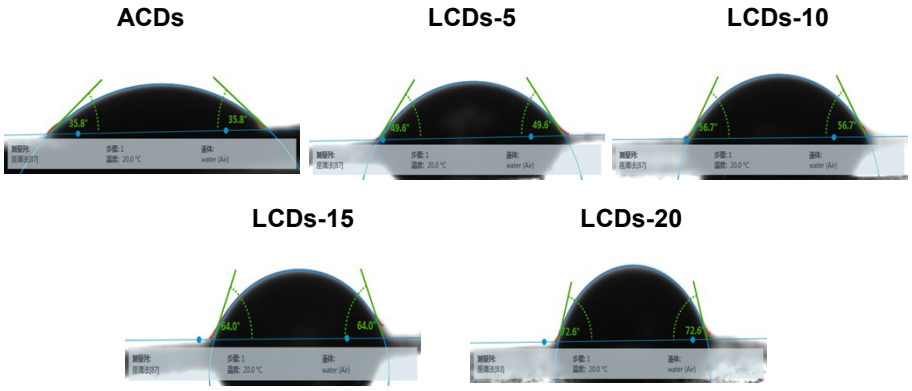
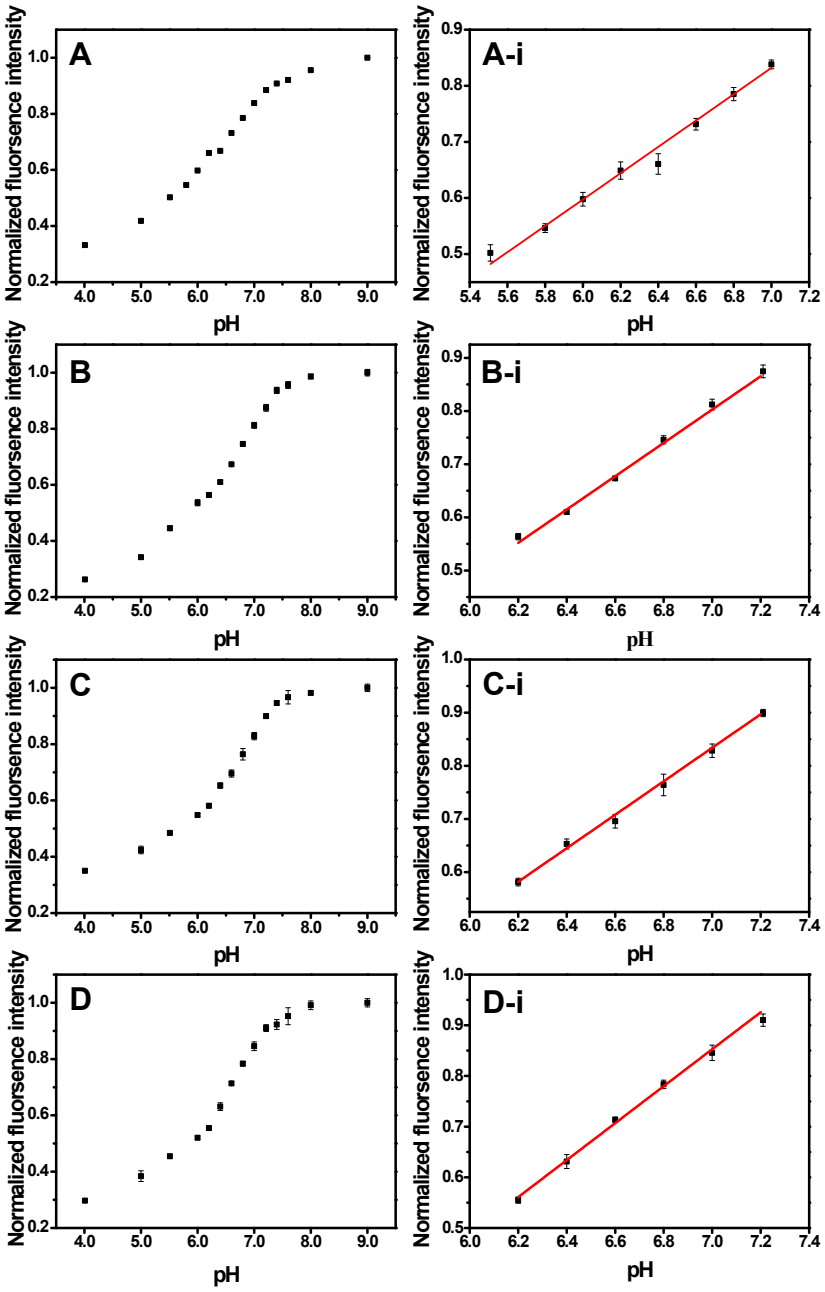


Figure S2. The contact angles of ACDs, LCDs-5, LCDs-10, LCDs-15, LCDs-20.



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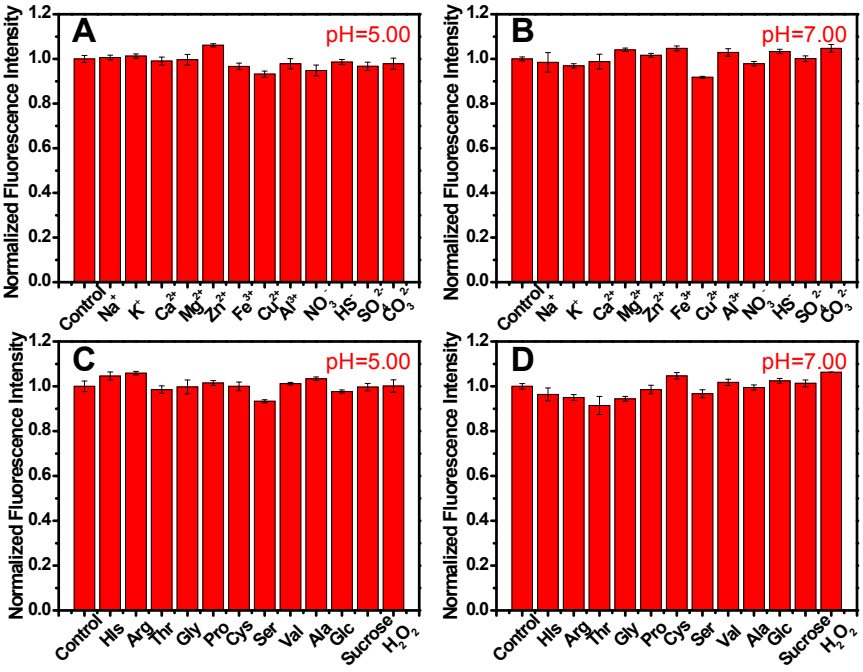
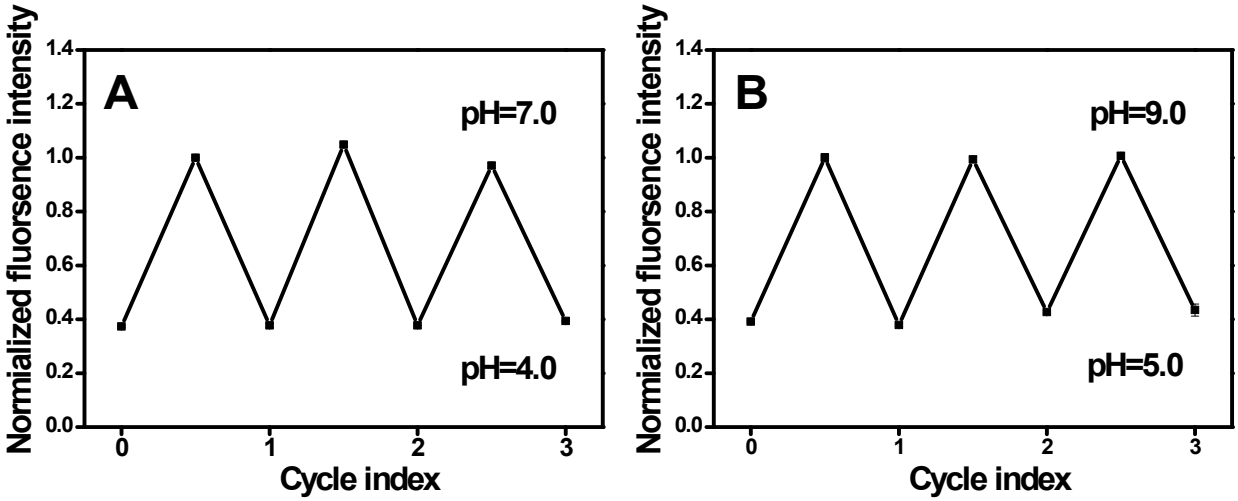


Figure S4. Normalized fluorescence intensity of ACDs at pH 5.00 (A and B) and LCDs at pH 7.00 (C and D) in the presence of various metal ions, anion and amino acid (Concentration: 0.05 mM for Fe^{3+}, $Cu^{2+}$and Al^{3+}; 1.0 mM for others); Conditions: E_x/E_m=350/440 nm for ACDs; E_x/E_m=360/430 nm for LCDs.



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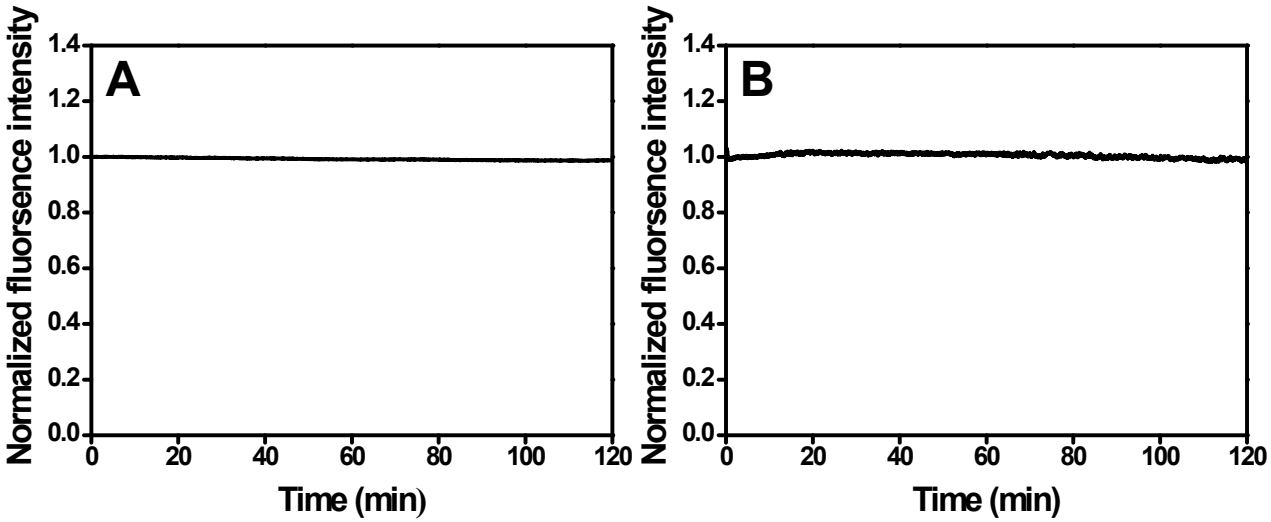

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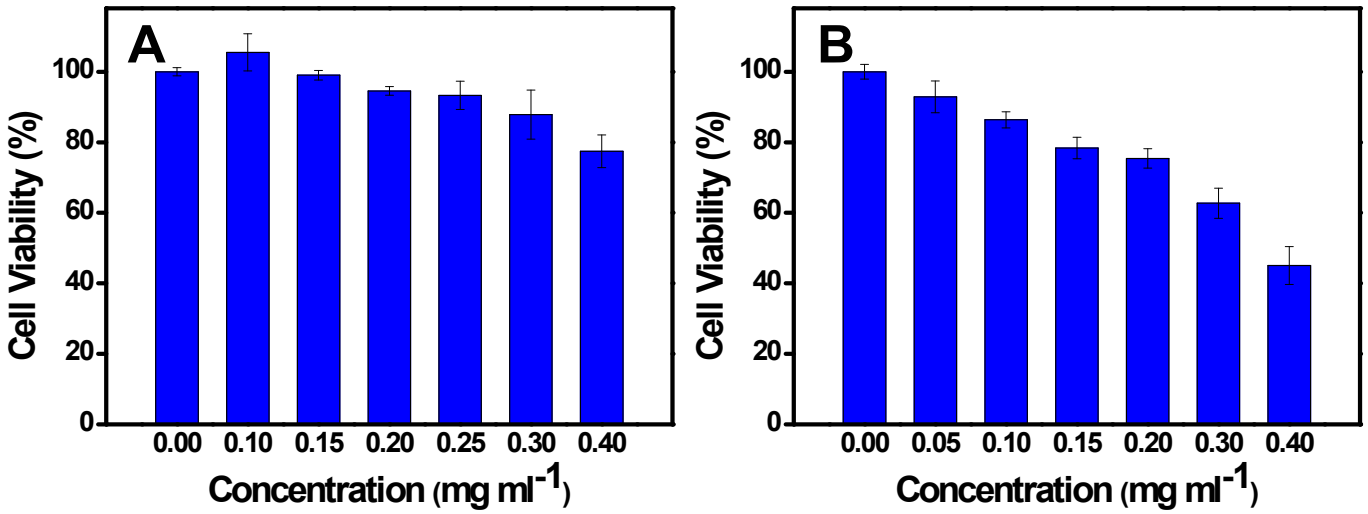

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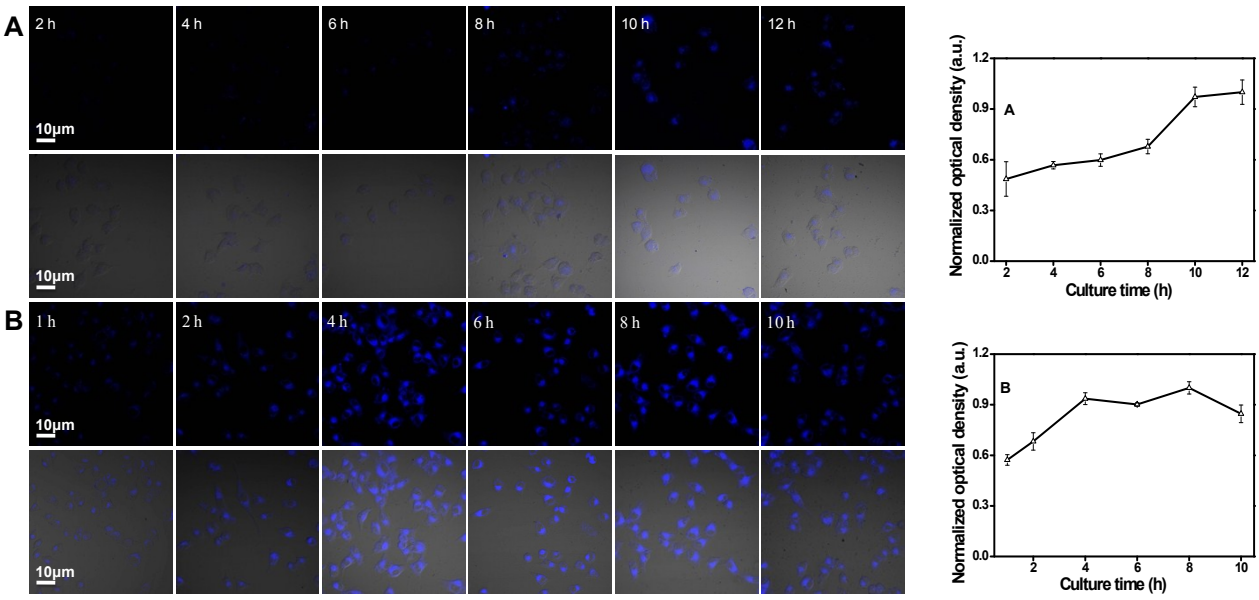

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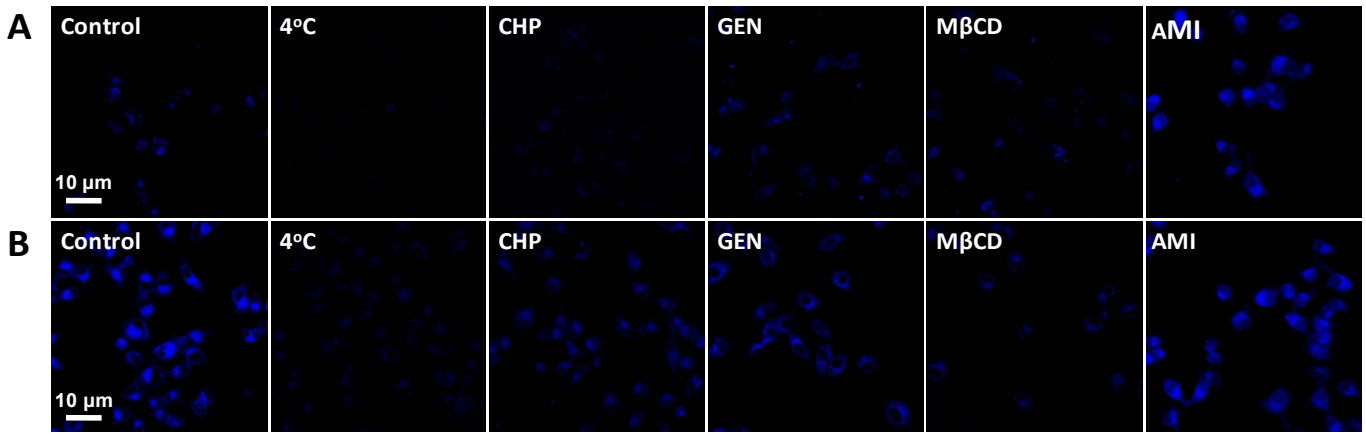

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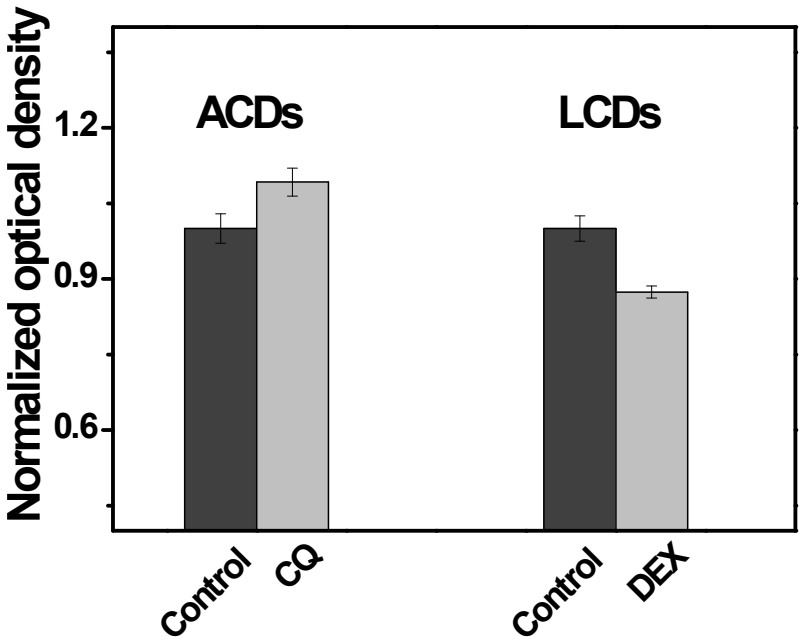

Figure S10. Normalized optical density of MCF-7 cells cultured with ACDs simulated with chloroquine and LCDs treated with dexamethasone.

Table S1. The pH response of the CDs prepared with different amount of laurylamine

Sample	pH Linear range	Linearity equation	R^2
ACDs	4.0-5.4	y=0.3629x-1.018	0.9861
LCDs-5	5.5-7.0	y=0.2347x-08113	0.9930
LCDs-10	6.2-7.2	y=0.3134x-1.3914	0.9899
LCDs-15	6.2-7.2	y=0.3150x-1.3715	0.9978
LCDs-20	6.2-7.2	y=0.3648x-1.7009	0.9944

Table S2. The correlation coefficient of ACDs and LCDs with different organelle probe

Sample / Probe	ACDs		LCDs	
	PCC*	OLC*	PCC	OLC
Lyso-Tracker Red	0.95	0.96	0.54	0.58
MitoRed	0.30	0.37	0.40	0.45
ER-Tracker Red	0.55	0.59	0.92	0.94
Golgi-Tracker Red	0.20	0.22	0.40	0.43

*PCC:Pearson's correlation coefficient; *OLC: Overlap coefficient