

# On-Line Supporting Information

## Silver Nanoparticles Incite Size and Dose-Dependent Developmental Phenotypes and Nanotoxicity in Zebrafish Embryos

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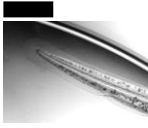


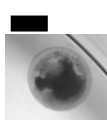
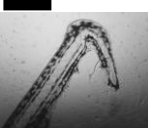



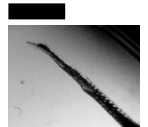

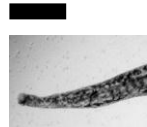
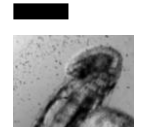
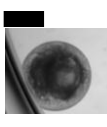
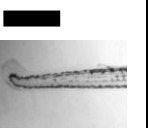
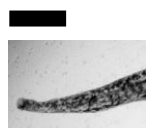

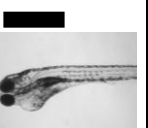
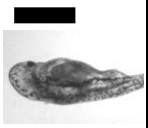
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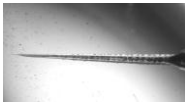

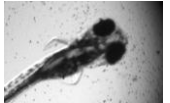
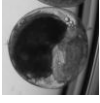
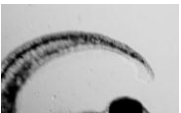
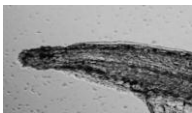
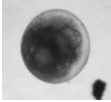
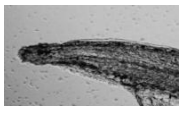
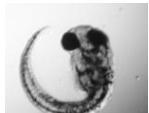
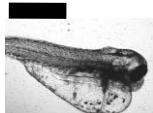


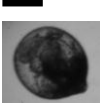


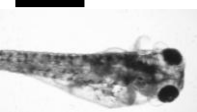
**Table SI:** Summary of normal and deformed zebrafish developed from given-stage embryos acutely treated with the Ag NPs ( $97 \pm 13$  nm) for 2 h


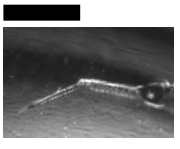

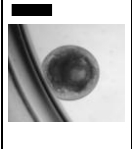
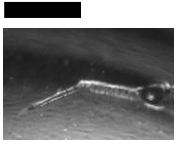


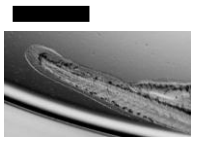
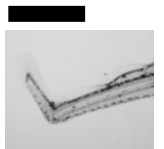
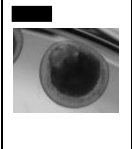
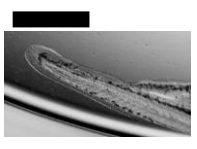
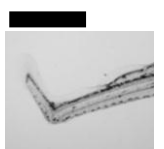


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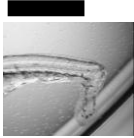
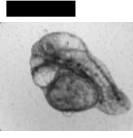

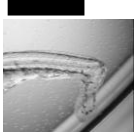
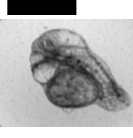

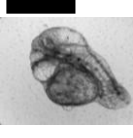
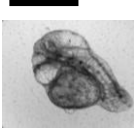



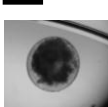
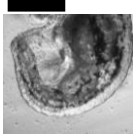
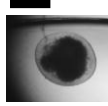
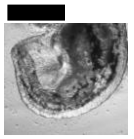
\* To whom correspondence should be addressed: Email: [xhxu@odu.edu](mailto:xhxu@odu.edu); [www.odu.edu/sci/xu/xu.htm](http://www.odu.edu/sci/xu/xu.htm); Tel/fax: (757) 683-5698

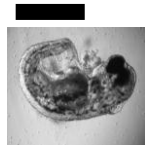
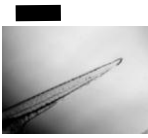

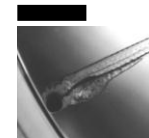
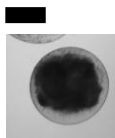
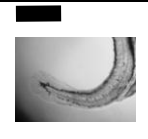

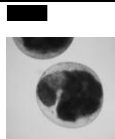




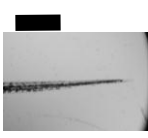
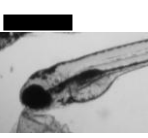
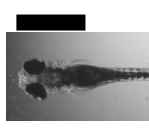
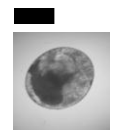

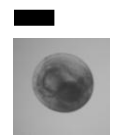

**Table S1: Summary of normal and deformed zebrafish developed from given-stage embryos acutely treated with the Ag NPs (97 ± 13 nm) for 2 h**

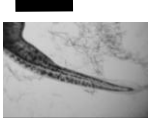

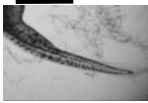
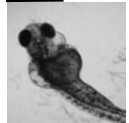

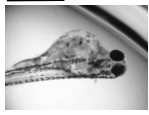
NP C (pM)	Images of Zebrafish				Number of Zebrafish with Severity Scale*					Dead	
					0	1	2	3	4		
<b>Stage I</b>											
0	Control: Normal Development				45±0						3±0
											
2	Finfold Abnormality*				38±3		1				7±1
											
	Tail/Spinal Cord Flexure and Truncation*							1			
											
4	Finfold Abnormality*				19±2		1	1	3		21±2
											
	Tail/Spinal Cord Flexure and Truncation*					2		1			
											
	Cardiac Malformation/Edema***, Yolk Sac Edema***								1♦		
											
	Cardiac Malformation/Edema***, Yolk Sac Edema***, Eye Abnormality***								1♦		
											

	Cardiac Malformation/Edema <sup>**</sup> , Yolk Sac Edema <sup>**</sup> , Head Abnormality <sup>**</sup> , No Eyes <sup>**</sup>							1 <sup>♦</sup>	
									
	<b>Stage II</b>								
<b>0</b>	Control: Normal Development			44±1					4±1
									
<b>2</b>	Finfold Abnormality <sup>*</sup>			24±2		1		1	15±2
									
	Tail/Spinal Cord Flexure and Truncation <sup>*</sup>					1		1	
									
	Cardiac Malformation/Edema <sup>**</sup> , Yolk Sac Edema <sup>**</sup> , Eye Abnormality <sup>**</sup>							1 <sup>♦</sup>	
									
<b>4</b>	Finfold Abnormality <sup>*</sup>			25±3		1		1	17±2
									
	Tail/Spinal Cord Flexure and Truncation <sup>*</sup>					1		1	
									
	Cardiac Malformation/Edema <sup>**</sup> and Yolk Sac Edema <sup>**</sup>							1 <sup>♦</sup>	
									

	Cardiac Malformation/Edema <sup>**</sup> , Eye Abnormality <sup>**</sup> , Yolk Sac Edema <sup>**</sup>						1 <sup>♦</sup>	
								
<b>8</b>	Finfold Abnormality <sup>*</sup>		14±2		1	1		28±2
								
	Tail/Spinal Cord Flexure and Truncation <sup>*</sup>				1	1		
								
	Cardiac Malformation/Edema <sup>**</sup> and Yolk Sac Edema <sup>**</sup>						1 <sup>♦</sup>	
								
<b>16</b>	Finfold Abnormality <sup>*</sup>		5±1		1	1		38±2
								
	Tail/Spinal Cord Flexure and Truncation <sup>*</sup>				1		1	
								
	Cardiac Malformation/Edema <sup>**</sup> and Yolk Sac Edema <sup>**</sup>						1 <sup>♦</sup>	
								
	Cardiac Malformation/Edema <sup>**</sup> , Eye Abnormality <sup>**</sup> , Yolk Sac Edema <sup>**</sup>						1 <sup>♦</sup>	
								

24	Finfold Abnormality*			6±2	1			1	37±3
									
	Tail/Spinal Cord Flexure and Truncation*						2		
									
	Cardiac Malformation/Edema**						1♦		
									
	Yolk Sac Edema**, Eye Abnormality**, Head Abnormality**						1♦		
									
	<b>Stage III</b>								
	Control: Normal Development			42±0					6±0
									
	Finfold Abnormality*			12±2				1	34±2
									
	Tail/Spinal Cord Flexure and Truncation*						1		
									
	Cardiac Malformation/Edema**, Eye Abnormality**, Yolk Sac Edema**						1♦		

										
<b>Stage IV</b>										
<b>0</b>	Control: Normal Development							45±0		3±0
										
<b>4</b>	Finfold Abnormality*							43±3	2	4±4
										
	Tail/Spinal Cord Flexure and Truncation*								2	
										
	Cardiac Malformation/Edema** , Eye Abnormality** , Yolk Sac Edema**									2*
										
<b>Stage V</b>										
<b>0</b>	Control: Normal Development							46±1		2±1
										
<b>2</b>	Finfold Abnormality*							47±1		2±1
										
	Tail/Spinal Cord Flexure and Truncation*								1	
										

8	Finfold Abnormality*			24±2	1				21±1
									
	Tail/Spinal Cord Flexure and Truncation*					1			
									
	Cardiac Malformation/Edema** and Yolk Sac Edema**						3*		
									

\* We have developed and used our own scoring system, based upon the severe deviations from the normal development, to semi-quantitatively rank deformity from 0 (normal) to 4 or 3 (the severest of finfold and tail abnormality), respectively. All other deformities (e.g., yolk sac edema, cardiac malformation/Edema, eye abnormality, head abnormality, and no eyes) are rated as 4, because these deformities are typically accompanied with finfold and tail abnormality.

\* Multiple types of deformities observed in same zebrafish are repeatedly listed in the respective category.

≠ Rare type of deformities and their deformation severities are unable to be rated.

Scale bars = 500 μm