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Technical Information

NpFlamma® HGC series

Overview

NpFlamma® HGC series is a fluorescent dye incorporated chitosan based amphiphilic nanoparticles that enables to selectively detect tumor cells. Chitosan nanoparticles can selectively accumulate in cancer tissues due to high permeability for new blood vessels in cancer tissues. Chitosan particles display low toxicity along with absence of noticeable side effect *in vivo*, yet they exhibit a long half-life, high stability and aqueous solubility. Thus, NpFlamma® HGC series is an ideal fluorescence agent for *in vivo* imaging of angiography and tumor progression. The hydrophobic nature of NpFlamma® HGC series can embed hydrophobic materials, thus they can be utilized as a selective carrier for hydrophobic cancer drugs such as doxorubicin and paclitaxel, etc.

Table 1. NpFlamma® HGC series list

Cat. No.	Product name	Ex (nm)	Em (nm)	Common filter set	Excitation source
PNC1201	NpFlamma® HGC 648	648	675	Cy 5	594, 633 nm
PNC1401	NpFlamma® HGC 675	675	698	Cy 5.5	633, 680 nm
PNC1301	NpFlamma® HGC 749	750	782	Cy 7	680 nm
PNC1601	NpFlamma® HGC 774	777	802	Cy 7.5	785 nm
PNC1501	NpFlamma® HGC ICG	785	821	Cy 7.5	785 nm

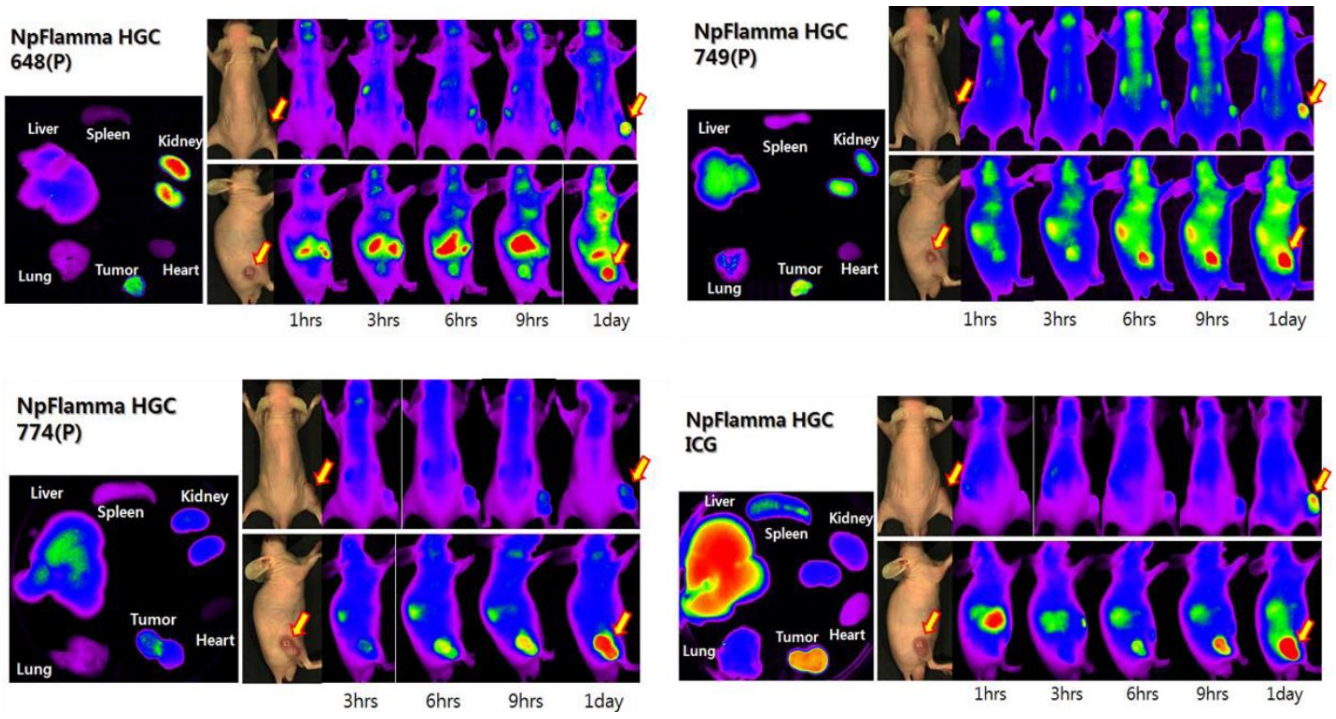


Figure 1. In vivo tumor imaging of NpFlamma® HGC series

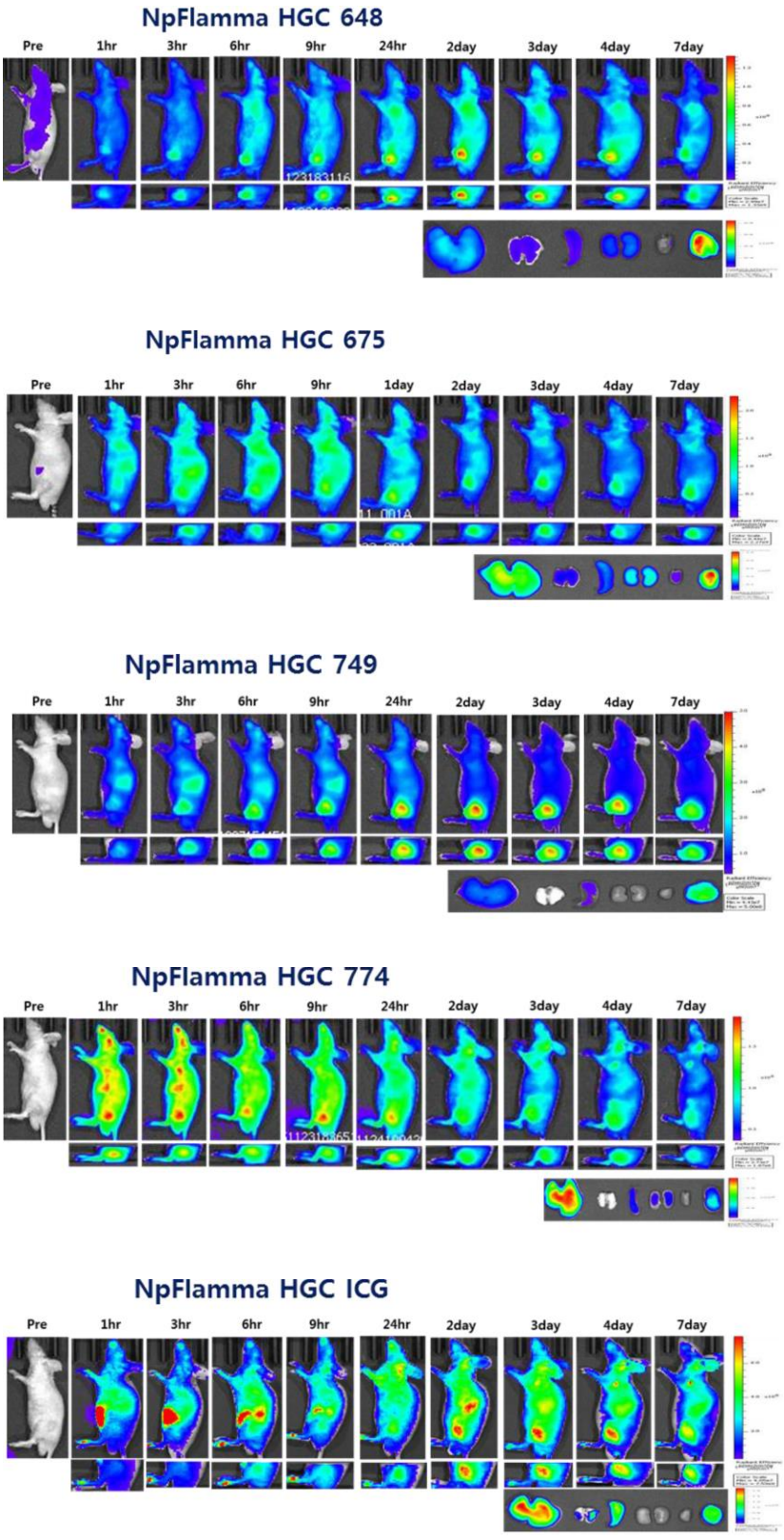
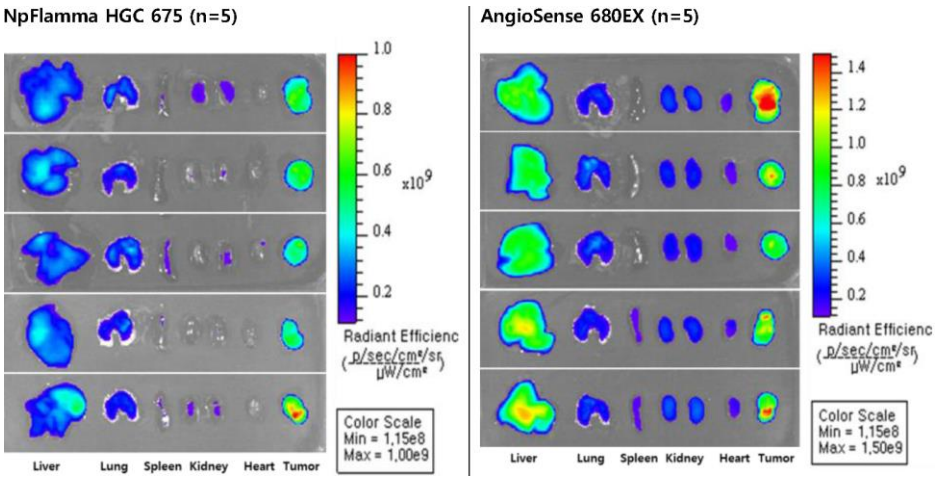


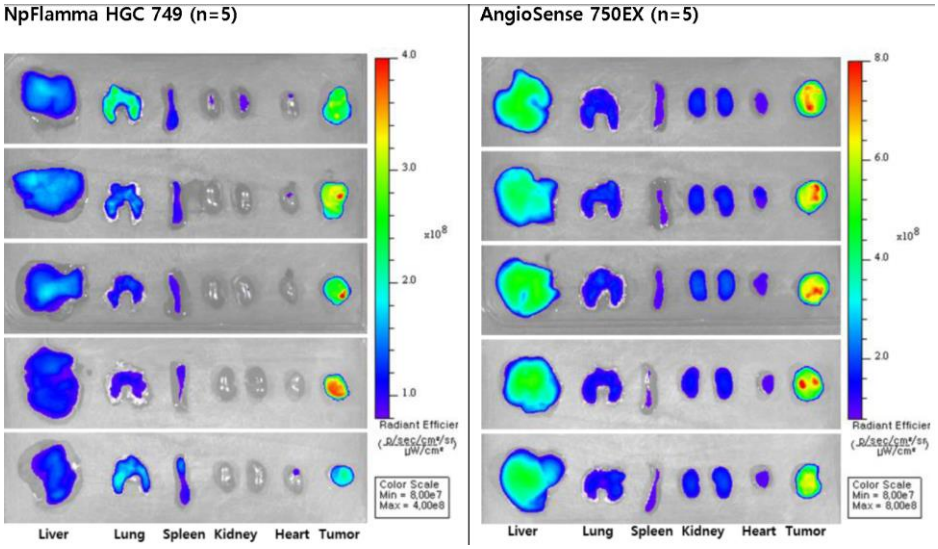
Figure 2. In vivo imaging of five NpFlamma® HGC series over seven days
Fluorescence from cancer cell continued after 7 days injection, but fluorescence from other organs disappeared.



Fluorescence intensity ratio between tumor cell and other organs to liver

	Liver	Lung	Spleen	Kidney	Heart	Tumor
1	1	0.940	-	0.509	-	1.812
2	1	0.669	-	-	-	1.747
3	1	0.944	-	-	-	1.650
4	1	0.657	-	-	-	1.509
5	1	0.613	-	-	-	1.998

	Liver	Lung	Spleen	Kidney	Heart	Tumor
1	1	0.325	-	0.406	0.226	1.634
2	1	0.431	-	0.368	0.237	1.329
3	1	0.358	-	0.324	0.203	1.022
4	1	0.276	0.158	0.330	0.214	1.058
5	1	0.305	0.168	0.373	0.209	1.072



Fluorescence intensity ratio between tumor cell and other organs to liver

	Liver	Lung	Spleen	Kidney	Heart	Tumor
1	1	1.632	-	-	-	2.271
2	1	0.879	-	-	-	2.292
3	1	0.834	-	-	-	2.171
4	1	0.682	-	-	-	2.762
5	1	1.476	-	-	-	1.955

	Liver	Lung	Spleen	Kidney	Heart	Tumor
1	1	0.357	-	0.388	-	1.311
2	1	0.398	-	0.410	-	1.626
3	1	0.319	-	0.372	-	1.358
4	1	0.360	-	0.405	-	1.400
5	1	0.396	-	0.451	-	1.389

Figure 3. Comparison of ex-vivo imaging of NpFlamma® HGC and another imaging agent
NpFlamma® HGC series displays higher tumor cell accumulation than that of AngioSense

In vivo Imaging Protocol

General

- Prepare the fluorescent probe solution by adding DW or PBS to the NpFlamma® HGC series powder and vortex the mixture (1does = 120 μg per 100 μL)
- Since fluorescent substances are unstable under light, they should be stored in the dark.
- Mouse fur may cause scattering or absorption of excitation of light during optical imaging process. Use nude mouse or remove the mouse fur in advance.
- It is recommended to use 31 G syringe needle.
- Prepare 5 week-old male Balb/c-nude mouse.

Typical procedure for mouse model tumor imaging with NpFlamma® HGC

- Inject SCC7 cell line ($1x10^6$ per 0.1 mL) into subcutaneous of Balb/c-nude mouse.
- When the volume of tumor cell reaches to 60~80 mm^3, take the zero time image of each subject.
- Inject NpFlamma® HGC series (120 μg per 100 μL) intravenously to mouse.
- The optimal interval for fluorescence imaging is 1 h, 3 h, 6 h, 9 h, and 24 h after injection.
- After take the 24 h imaging, extract major organs (liver, lung, spleen, kidney, heart) and tumor cell, and perform the ex-vivo imaging process.

Custom Labeling Service

Based on accumulated know-how and technologies, BioActs provide a wide range of custom services such as protein fluorescence labeling, organic synthesis, oligonucleotide synthesis upon customers' request. Our reliable technology has acknowledged by our clients from domestic and overseas universities, institutions, in vitro diagnostic and pharmaceutical companies and has enabled to steadily conduct their requirements. In addition, we can introduce fluorescent materials to many other compounds such as organic and inorganic compounds, drugs, hormones, polymer, peptides, proteins, antibodies, etc. We also can provide chemical and optical analytical data, along with cell and animal experiments.

Technical Support

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SDS (Safety Data Sheets) You can find SDS at www.bioacts.com, the official website of BioActs.
CoA (Certificate of Analysis) provides detailed quality information of each product. To see CoA, check the lot number written on each product's page at www.bioacts.com, when having trouble with check, contact to our technical support team

This product can be used only for research purpose, and it can't be used to treat or diagnose human body or animals.
The product cannot be resold to other regions except for South Korea.
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