

Nile Therapeutics, Inc.  
Form 424B3  
August 15, 2011

Filed Pursuant to Rule 424(b)(3)  
File No. 333-175726

Prospectus Supplement No. 1  
(to Prospectus dated August 8, 2011)

This Prospectus Supplement No. 1 supplements and amends our prospectus dated August 8, 2011 (the "Prospectus"). The selling stockholders identified on page 23 of the Prospectus are offering on a resale basis a total of 7,750,000 shares of our common stock, including 2,750,000 shares issuable upon the exercise of outstanding warrants.

Attached hereto and incorporated by reference herein is our Quarterly Report on Form 10-Q for the quarter ended June 30, 2011, which we filed with the Securities and Exchange Commission on August 15, 2011. The information set forth in the attached Quarterly Report supplements and amends the information contained in the Prospectus.

This Prospectus Supplement No. 1 should be read in conjunction with, and delivered with, the Prospectus and is qualified by reference to the Prospectus except to the extent that the information in this Prospectus Supplement No. 1 supersedes the information contained in the Prospectus.

Our common stock is quoted on the OTCQB under the symbol "NLTX.PK" On August 12, 2011, the last sale price of our common stock as reported on the OTCQB was \$0.66.

Investing in our common stock involves a high degree of risk.  
See "Risk Factors" beginning on page 3 of the Prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined that the Prospectus or this Prospectus Supplement No. 1 is truthful or complete. A representation to the contrary is a criminal offense.

The date of this Prospectus Supplement No. 1 is August 15, 2011.

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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

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FORM 10-Q

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(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE QUARTERLY PERIOD ENDED JUNE 30, 2011

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE TRANSITION PERIOD FROM TO

Commission File Number: 001-34058

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NILE THERAPEUTICS, INC.  
(Exact Name Of Registrant As Specified In Its Charter)

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Delaware  
(State of Incorporation)

88-0363465  
(I.R.S. Employer Identification No.)

4 West 4th Ave., Suite 400, San Mateo, CA 94402  
(Address of principal executive offices)(Zip Code)

(650) 458-2670  
(Registrant's telephone number, including area code)

Not Applicable  
(Former name, former address and former fiscal year, if changed since last report)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes  No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).  Yes  No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer,

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or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer  (Do not check if a smaller reporting company)

Smaller reporting company

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes  No

As of August 12, 2011, there were 39,707,764 shares of common stock, par value \$0.001 per share, of Nile Therapeutics, Inc. issued and outstanding.

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### Forward-Looking Statements

This Quarterly Report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Any statements about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. These forward-looking statements include, but are not limited to, statements about:

- the development of our product candidates;
- the regulatory approval of our product candidates;
- our use of clinical research centers and other contractors;
- our ability to find collaborative partners for research, development and commercialization of potential products;
- acceptance of our products by doctors, patients or payors;
- our ability to market any of our product candidates;
- our history of operating losses;
- our ability to compete against other companies and research institutions;
- our ability to secure adequate protection for our intellectual property;
- our ability to attract and retain key personnel;
- availability of reimbursement for our product candidates;
- the effect of potential strategic transactions on our business;
- our ability to obtain adequate financing; and
- the volatility of our stock price.

These statements are often, but not always, made through the use of words or phrases such as “anticipate,” “estimate,” “plan,” “project,” “continuing,” “ongoing,” “expect,” “believe,” “intend” and similar words or phrases. For such statements, we are providing the protection of the Private Securities Litigation Reform Act of 1995. Readers of this Quarterly Report on Form 10-Q are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the time this Quarterly Report on Form 10-Q was filed with the Securities and Exchange Commission, or SEC. These forward-looking statements are based largely on our expectations and projections about future events and future trends affecting our business, and are subject to risks and uncertainties that could cause actual results to differ materially from those anticipated in the forward-looking statements. Discussions containing these forward-looking statements may be found throughout this report, including Part I, the section entitled “Item 2: Management’s Discussion and Analysis of Financial Condition and Results of Operations.” These forward-looking statements involve risks and uncertainties, including the risks discussed in our Annual Report on Form 10-K for the year ended December 31, 2010 (“Form 10-K”), that could cause our actual results to differ materially from those in the forward-looking statements. Except as required by law, we undertake no obligation to publicly revise our forward-looking statements to reflect

events or circumstances that arise after the filing of this report or documents incorporated by reference herein that include forward-looking statements. The risks discussed in our Form 10-K and in this report should be considered in evaluating our prospects and future financial performance.

In addition, past financial or operating performance is not necessarily a reliable indicator of future performance and you should not use our historical performance to anticipate results or future period trends. We can give no assurances that any of the events anticipated by the forward-looking statements will occur or, if any of them do, what impact they will have on our results of operations and financial condition.

References to the “Company,” “Nile,” the “Registrant,” “we,” “us,” or “our” in this report refer to Nile Therapeutics, Inc., a Delaware corporation, unless the context indicates otherwise.

## PART I — FINANCIAL INFORMATION

## Item 1. Financial Statements.

## NILE THERAPUTICS, INC.

(A DEVELOPMENT STAGE COMPANY)  
CONDENSED BALANCE SHEETS

	June 30, 2011 (unaudited)	December 31, 2010
<b>ASSETS</b>		
Current assets		
Cash and cash equivalents	\$ 3,259,835	\$ 3,378,155
Prepaid expenses and other current assets	379,877	219,095
<b>Total current assets</b>	<b>3,639,712</b>	<b>3,597,250</b>
Property and equipment, net	12,698	16,765
Other noncurrent assets	51,938	51,938
<b>Total assets</b>	<b>\$ 3,704,348</b>	<b>\$ 3,665,953</b>
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
Current liabilities		
Accounts payable	\$ 237,760	\$ 332,380
Accrued expenses and other current liabilities	161,143	652,275
Due to related party	37,371	84,430
<b>Total current liabilities</b>	<b>436,274</b>	<b>1,069,085</b>
Commitments and contingencies		
Stockholders' equity		
Preferred stock, \$0.001 par value, 10,000,000 shares authorized, none issued and outstanding	-	-
Common stock, \$0.001 par value, 100,000,000 shares authorized, 39,707,764 and 34,629,794 shares issued and outstanding	39,708	34,630
Additional paid-in capital	45,234,882	42,492,432
Deficit accumulated during the development stage	(42,006,516 )	(39,930,194 )
<b>Total stockholders' equity</b>	<b>3,268,074</b>	<b>2,596,868</b>
<b>Total liabilities and stockholders' equity</b>	<b>\$ 3,704,348</b>	<b>\$ 3,665,953</b>

See accompanying notes to the unaudited condensed financial statements.





NILE THERAPUTICS, INC.  
(A DEVELOPMENT STAGE COMPANY)  
CONDENSED STATEMENTS OF OPERATIONS  
(unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,		Period from
	2011	2010	2011	2010	August 1, 2005 (inception) through June 30, 2011
<b>Income</b>					
Grant income	\$ -	\$ -	\$ -	\$ -	\$ 482,235
Collaboration income	346,000	-	346,000	-	346,000
<b>Total income</b>	<b>346,000</b>	<b>-</b>	<b>346,000</b>	<b>-</b>	<b>828,235</b>
<b>Operating expenses:</b>					
Research and development	702,930	1,055,759	1,325,262	2,369,181	27,184,202
General and administrative	523,305	445,448	1,098,583	1,068,650	15,308,014
<b>Total operating expenses</b>	<b>1,226,235</b>	<b>1,501,207</b>	<b>2,423,845</b>	<b>3,437,831</b>	<b>42,492,216</b>
<b>Loss from operations</b>	<b>(880,235 )</b>	<b>(1,501,207 )</b>	<b>(2,077,845 )</b>	<b>(3,437,831 )</b>	<b>(41,663,981 )</b>
<b>Other income (expense):</b>					
Interest income	1,046	6,726	3,032	11,572	790,991
Interest expense	-	-	-	-	(1,273,734 )
Other income (expense)	(1,341 )	(40 )	(1,509 )	(82 )	140,208
<b>Total other income (expense)</b>	<b>(295 )</b>	<b>6,686</b>	<b>1,523</b>	<b>11,490</b>	<b>(342,535 )</b>
<b>Net loss</b>	<b>\$(880,530 )</b>	<b>\$(1,494,521 )</b>	<b>\$(2,076,322 )</b>	<b>\$(3,426,341 )</b>	<b>\$(42,006,516 )</b>
<b>Basic and diluted loss per share</b>	<b>\$(0.03 )</b>	<b>\$(0.05 )</b>	<b>\$(0.06 )</b>	<b>\$(0.12 )</b>	
<b>Weighted-average common shares outstanding</b>	<b>35,091,653</b>	<b>32,285,824</b>	<b>34,882,947</b>	<b>29,700,189</b>	

See accompanying notes to the unaudited condensed financial statements.

NILE THERAPEUTICS, INC.  
(A DEVELOPMENT STAGE COMPANY)  
CONDENSED STATEMENT OF STOCKHOLDERS' EQUITY (DEFICIT)  
PERIOD FROM AUGUST 1, 2005 (INCEPTION) TO JUNE 30, 2011  
(unaudited)

	COMMON STOCK		ADDITIONAL PAID-IN CAPITAL	DEFICIT	TOTAL STOCKHOLDERS' EQUITY (DEFICIT)
	SHARES	AMOUNT		ACCUMULATED DURING THE DEVELOPMENT STAGE	
Issuance of common shares to founders	13,794,132	\$ 13,794	\$ (8,794 )	\$ -	\$ 5,000
Founders shares returned to treasury	(1,379,419 )	-	-	-	-
Net loss	-	-	-	(10,043 )	(10,043 )
Balance at December 31, 2005	12,414,713	13,794	(8,794 )	(10,043 )	(5,043 )
Issuance of common shares pursuant to licensing agreement	1,379,419	-	500	-	500
Issuance of stock options for services	-	-	10,000	-	10,000
Net loss	-	-	-	(2,581,972 )	(2,581,972 )
Balance at December 31, 2006	13,794,132	13,794	1,706	(2,592,015 )	(2,576,515 )
Issuance of common shares pursuant to licensing agreement	63,478	64	182,172	-	182,236
Issuance of common shares pursuant to licensing agreement	350,107	350	999,650	-	1,000,000
Common shares sold in private placement, net of issuance costs of \$102,000	6,957,914	6,958	19,865,789	-	19,872,747
Warrants issued in connection with note conversion	-	-	288,000	-	288,000
Conversion of notes payable upon event of merger	1,684,085	1,684	4,349,481	-	4,351,165
Note discount arising from beneficial conversion feature	-	-	483,463	-	483,463

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Reverse merger transaction					
Elimination of accumulated deficit	-	-	(234,218 )	-	(234,218 )
Previously issued SMI stock	1,250,000	1,250	232,968	-	234,218
Employee stock-based compensation					
	-	-	1,902,298	-	1,902,298
Non-employee stock-based compensation					
	-	-	(667 )	-	(667 )
Net loss	-	-	-	(10,302,795 )	(10,302,795 )
Balance at December 31, 2007	24,099,716	24,100	28,070,642	(12,894,810 )	15,199,932
Warrants issued in satisfaction of accrued liabilities					
	-	-	334,992	-	334,992
Employee stock-based compensation					
	-	-	2,436,603	-	2,436,603
Non-employee stock-based compensation					
	-	-	13,687	-	13,687
Issuance of common shares pursuant to licensing agreement					
	49,689	50	249,950	-	250,000
Net loss	-	-	-	(13,131,596 )	(13,131,596 )
Balance at December 31, 2008	24,149,405	24,150	31,105,874	(26,026,406 )	\$ 5,103,618
Employee stock-based compensation					
	-	-	1,772,597	-	1,772,597
Non-employee stock-based compensation					
	-	-	473,584	-	473,584
Units sold in private placement, net of issuance costs of \$282,773					
	2,691,394	2,691	3,284,484	-	3,287,175
Stock option and warrant exercises					
	245,025	245	217,228	-	217,473
Net loss	-	-	-	(7,872,297 )	(7,872,297 )
Balance at December 31, 2009	27,085,824	27,086	36,853,767	(33,898,703 )	2,982,150
Employee stock-based compensation					
			1,142,552	-	1,142,552
Non-employee stock-based compensation					
	-	-	(19,249 )	-	(19,249 )

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Units sold in private placement, net of issuance costs of \$715,801	7,475,000	7,475	4,509,224	-	4,516,699
Stock option and warrant exercises	68,970	69	6,138	-	6,207
Net loss	-	-	-	(6,031,491 )	(6,031,491 )
Balance at December 31, 2010	34,629,794	34,630	42,492,432	(39,930,194 )	2,596,868
Employee stock-based compensation			437,715	-	437,715
Stock option and warrant exercises	77,970	78	11,169	-	11,247
Units sold in private placement, net of issuance costs of \$201,434	5,000,000	5,000	2,293,566	-	2,298,566
Net loss	-	-	-	(2,076,322 )	(2,076,322 )
Balance at June 30, 2011	39,707,764	\$39,708	\$ 45,234,882	\$ (42,006,516 )	\$ 3,268,074

See accompanying notes to the unaudited condensed financial statements.

NILE THERAPEUTICS, INC.  
(A DEVELOPMENT STAGE COMPANY)  
CONDENSED STATEMENTS OF CASH FLOWS  
(unaudited)

	Six Months Ended June 30,		Period from
	2011	2010	August 1, 2005 (inception) through June 30, 2011
Cash flows from operating activities			