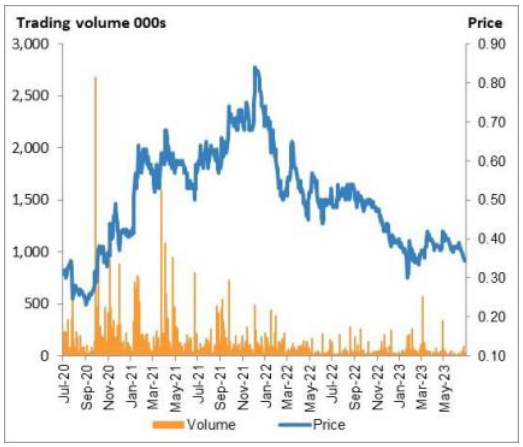
Microbix Biosystems Inc.

18 July 2023

MBX-T: $0.35, MBXBF-OTC: US$0.26

Bruce Krugel 416-509-5593

Price	$0.35	Market Cap		$47,697
Target Price	$1.00	Debt		$6,543
Projected Return	190%	Cash		-$11,722
52 Week Range	0.55/0.3	EV ($000s)		$42,519
Basic Shares (000's)	138,253			
FD Shares (000's)*	183,356			
Insiders	13.0%			
Y/E September	**2021**	**2022**	**2023E**	**2024E**
Revenues ($000s)	18,593	19,076	18,492	32,458
EBITDA ($000s)	5,659	3,647	2,985	13,880
Adj. EBITDA** ($000s)			1,635	9,880
FDEPS	0.02	0.01	0.01	0.07
EV/EBITDA	7.5x	11.7x	14.2x	3.1x
*=Assumes conversion of CD				
**= Adj EBITDA excludes impact of Sequel progress payments				



Profile

Microbix Biosystems Inc. (MBX-T) is a Canada-based life science company and manufacturer of viral and bacterial antigens and cell, culture-based biological products and technologies. MBX's catalogue of antigens covers +30 bacterial and viral pathogens implicated in maternal, pediatric, childhood, respiratory, sexually transmitted and insect-borne diseases. MBX is now focusing on a higher growth opportunity: its QAPs™ product line, targeting quality controls within accreditation organizations, IVD equipment manufacturers and clinical laboratories. Partners are being sought for its development asset, Kinlytic Urokinase, a biologic thrombolytic drug used to treat blood clots.

Disclosure

Please refer to important disclosures on page 11.

FQ2/23: RECOVERY IN CORE ANTIGEN BUSINESS AND ANTICIPATED QAPS™ RAMP SETS TONE FOR F23. WE DERIVE $1.00 TGT.

- **Revenues.** The -13.6% YoY decline in total revenues was due to the exclusion of VTM sales. On a product line basis, **Antigen** revenues grew 86.3% YoY as MBX benefited from post-COVID recovery with the expectation that Antigen products are expected to grow at roughly 2x historical levels for the balance of F23. **QAP** sales declined -16.4%. However, we expect a strong recovery in this business for the balance of F23 as a previously announced large supply deal with a multinational diagnostic test developer has now broadened significantly in terms of the number of SKUs and MBX is engaging with its partner about the timing of product launches and stocking for a number QAPs™ SKUs.
- **VTM sales.** VTM orders from the Ontario government have been irregular and sales have now fallen away. Given our lack of visibility into this revenue stream, we now do not forecast any VTM revenues.
- **Margins.** Due to lower revenues and absence of higher margin VTM sales, gross margin declined YoY (59.9% vs 63.9%); but improved significantly from 47.4% in FQ1/23 as antigen yields improved.
- **EBITDA.** MBX returned to profitability in the quarter, consequently generating EBITDA of +$425k vs $1,195k in FQ2/22.
- **Cash balances.** In FQ2/23, MBX reported a -$703.7k net change in cash ending the quarter with a healthy $11.7m. Principal contributors to this decline included change in working capital (-$1.65m) due to inventory build, an increase in deferred revenues, healthy capex and share repurchases. This was offset by $1,290.8k proceeds from government loans and grants.
- **Kinlytic Urokinase.** Under a separate report, we cover this transaction and its financial impact on MBX in detail. On 16 May 2023, MBX announced that it had executed a commercialization agreement with Sequel Pharma LLC to reintroduce KU to the catheter clearance (CC) market. This Agreement represents the culmination of MBX's stated intention to re-commercialize KU. In summary, we historically attributed a $10m notional amount towards the value of this asset. We believe the Sequel agreement validates this approach and we will ascribe a discounted cash flow valuation upon receipt of refreshed FDA guidance and reaffirmation of Sequel's funding commitment.
- **Valuation.** We derive a target of $1.00 for MBX using an EV/EBITDA approach for the core business and then add $10.0m for the KU development asset.

FQ2/23 Revenues

The -13.6% year-over year decline in revenues (Figure 1), was driven principally by a lack of further VTM procurement by the Government of Ontario, which masked the substantial recovery in Antigen sales.

Figure 1: MBX FQ2/23 revenues ($000's)

	FQ2/23	FQ2/22	% change	Explanation
Antigen products	3,005	1,608	86.9%	Post COVID recovery
QAPs™	1,102	1,318	-16.4%	While down YoY, awaiting major customer product launches
VTM	-	1,861	-100%	Ontario Govt contract fulfilled
Royalties	112	94	19.7%	
Total	**4,218**	**4,881**	**-13.6%**	

Source: Company reports; KRC Insights

Antigen products. The antigen business was historically a $12.0 p.a. business (2018 and 2019). However, due to COVID, this declined to $8.3m-9.0m p.a. (F2020-F2022). The $3.0m recorded in FQ2/23 was last seen in FQ4/19 (Figure 2) suggesting that initial client restocking is occurring and a recovery toward pre-pandemic levels could be sustained. On the Q2/23 CC, management stated that it thinks that antigen products could be "…in the $2.5m to $3.5m range in the coming quarters".

Figure 2: MBX Antigen revenues ($000s)

Fiscal year	FQ1	FQ2	FQ3	FQ4	Full year
2017	1,887	2,580	2,705	2,720	9,892
2018	2,803	2,922	3,158	3,309	12,191
2019	2,341	3,736	2,792	3,112	11,981
2020	1,946	2,358	2,246	2,138	8,688
2021	2,138	2,524	2,399	2,021	9,082
2022	1,766	1,608	2,284	2,630	8,288
2023	1,004	3,005			

Source: Company reports

QAPs™. MBX continues to introduce more products in the QAPs™ category in anticipation for launch over the coming quarters with major international diagnostics companies.

MBX's QAPs™ product segments can be summarized as follows:

- PTDx™: sold directly to lab accreditation organizations (usually white label).
- PROCEEDx®: sold directly to OEMs for qualifying new instruments and training technicians. Included with their test kit consumables, particularly research use only (RUO) products for use in test systems IQ/OQ/PQ, Verification/Validation and Training.
- ONBOARDx™: Verification/Validation kit for instrument, kit or assay qualification and for use in internal processes and technician training.
- REDx® controls: to support the formal QC and QA programs of clinical laboratories. These are FDA listed and CE marked products designed for use as Quality Control Samples in a clinical setting.

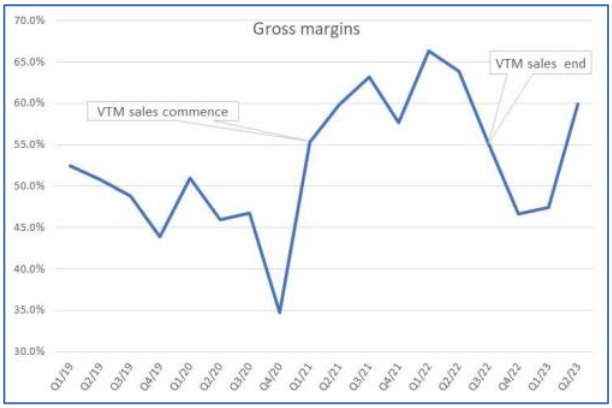
Also, MBX has a strategic agreement with Copan Italia S.p.A ., the global leader in specimen collection devices which allows MBX to access IP, co-brand and co-market FLOQSwab® versions of its products, increasing its addressable market.

VTM. Sales of viral transport medium (VTM) to the Ontario government came to an end while the Ontario government establishes new procurement processes. Management is in discussion with the province to determine whether there is a possibility of further orders.

FQ2/23 Gross Margins

Gross margins were 59.9% (Figure 3), down from the 63.9% reported FQ2/22 due to sales mix: Lower margin antigen revenues comprised 71.2% of total revenues vs 32.9% in Q2/22.

Figure 3: MBX gross margins



Source: Company reports, KRC Insights

The sequential improvement in gross margins was driven primarily by favourable antigens product mix, improving batch success-rates, and incrementally higher yields.

FQ2/23 Operating Expenses

Total operating expenses increased 10.3% YoY (Figure 4) primarily due to IT infrastructure implementations to support future growth. This includes start-up costs relating to ERP and eQMS implementations. These systems are essential for the future roll out, and expected revenue ramp, of QAPs™ products. Refer to the trend in capex (Figure 6).

Figure 4: MBX FQ3/F21 expenses ($000's)

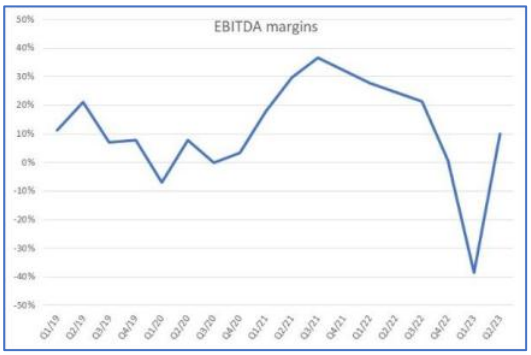
	FQ2/23	FQ2/22
Selling and business development	376	381
General and administrative	1,502	1,296
R&D	526	503
Total expenses	2,404	2,180

Source: Company reports; KRC Insights

FQ2/23 EBITDA margin

The net impact of higher sales and gross margins resulted in a substantial sequential improvement in EBITDA margin to 10.1% in FQ2/23 vs -38.4% in FQ1/23 (Figure 5).

Figure 5: MBX EBITDA margins



Source: Company reports; KRC Insights

Cash Flow and Balance Sheet

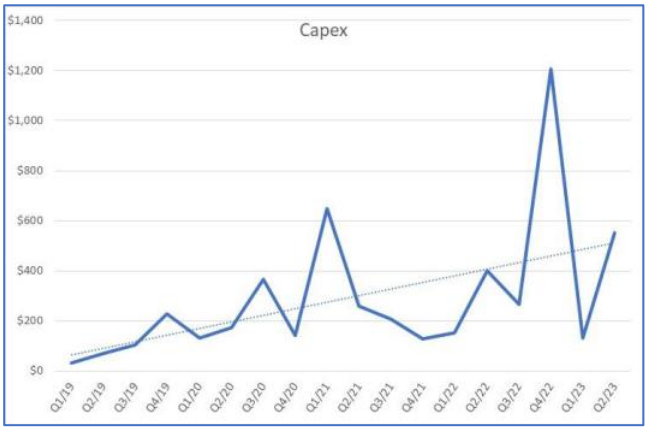
In FQ2/23, MBX reported a -$703.7k net change in cash, with cash balances still remaining healthy at $11.7m. Principal contributors to this decline includes:

- Change in working capital of -$1.65m driven primarily by an inventory build ($766.7k, mainly finished goods) and an increase in deferred revenues ($524.6k)
- Capex of $551k (Figure 6)
- Share repurchases of $400.1k

These outflows were offset by $1,290.8k proceeds from government loans and grants. MBX has historically made use of government grants to fund its capex:

- In July 2019, MBX signed an agreement with the Federal Economic Development Agency for Southern Ontario (FedDev) to provide a repayable government contribution whereby FedDev agreed to contribute 30% of the capital expenditures up to $2,752,500 over four years.
- On 14 February 2023, MBX agreed to an amendment to the original agreement providing an additional $840,000 of repayable contributions, increasing the total funding up to $3,592,500.
- On 13 October 2020, MBX announced a grant agreement with the Ontario Together Fund (“OTF”) of the Ministry of Economic Development, Job Creation and Trade (the “Grant”). The Grant of $1,445,000 was to cover 50% of the cost to automate production of MBX’s QAPs™ and automated production of the quantities of VTM needed for Ontario’s lab-based testing for COVID-19 disease or other tests of concern to public health or safety.
- On 20 March 2023, MBX announced an additional grant agreement with the OTF to cover 50% of the cost to further expand its capabilities ($840k) and capacity for manufacturing specialized products relating to diagnostic testing for infectious diseases at MBX’s three adjacent sites in Mississauga.

Figure 6: MBX capex ($000s)



Source: Company reports; KRC Insights

Currently, MBX manufacturing capacity can be summarized as follows in Figure 7:

Figure 7: MBX capacity expansion

Facility	Capacity (ft^2)	Details
235 Watline	11,000*	Manufacturing of vial and of FLOQSwab®-based QAPs™
265 Watline	14,000	Planning underway for upgrading portion of the core containment labs to BSL3.
275 Watline	10,000	VTM and Labs (R&D and Quality Control)
Total capacity	35,000	

Source: Company reports, KRC Insights; *=early 2019 MBX leased an additional 10,300ft^2 for initial QAPs™ expansion.

Management estimates that when these expansions are completed, along with the IT systems and ERP upgrades, they will support ~$100m revenue run rate.

MBX has made effective use of government funding for its capex as shown by long term debt (Figure 8).

Figure 8: MBX total debt at FQ2/23 ($000's)

	Current	Non-current	Total	Detail
Long term debt	111.1	3,799.8	3,910.9	Low interest govt loans: BDC $1.1m, Ontario govt $2.2m, and OTF grant of $504k
Lease liability	151.6	777.6	929.2	Primarily due to accounting treatment for two facility leases
Convertible Debentures		1,702.8	1,702.8	Debentures mature 9/28 and 1/29, bear interest at 9%, have a face value of $4.0m. These are in-the-money and most likely will be converted.
Total debt	262.7	6,280.2	6,542.9	

Source: Company reports, KRC Insights

The debt is well covered (Figure 9).

Figure 9: MBX FQ2/23 total capital employed ($000s)

	31/3/23
Share capital	49,340.6
Equity component of CDs	2,272.6
Contributed surplus	9,891.7
Accumulated deficit	-38,139.6
Total equity	23,365.2
Total debt	6,542.9
Total capital employed	29,908.1

Source: Company reports, KRC Insights

And MBX's updated share count, effectively consistent with FQ1/23, is shown in Figure 10:

Figure 10: MBX fully diluted share count (000s)

	Shares	Options	Warrants	Convert. Deb	FD Total
As at FQ2/23	138,253	12,159	15,552	17,391	183,356

Source: Company reports, KRC Insights

Estimates

We introduce forecasts for F24E.

Revenues

Our revenue estimates are shown in Figure 11:

Figure 11: MBX Revenue Forecasts ($000's)

Sept. year-end	2023E	2024E	Description
Antigen products	10,028	13,492	Continued recovery in antigen spending. Management expects balance of F23 revenue run rate at 2x historical levels. We expect this recovery to extend into F24.
% growth	21.0%	34.5%	
QAPs™	6,713	14,516	Ramp by major international diagnostic customers commenced in FQ2/23. Substantial capex pertaining to QAPs™ ramp evidence of ultimate strength of this business line. New areas of expansion include sexually transmitted infections as well as cancer screening (HPV).
% growth	24.9%	116.2%	
Royalties & Other	1,751	4,450	Includes Sequel progress payments of US$1.0m in F'23 and US$3.0m in F'24
% growth	328.4%	154.1%	
Total Sales	18,492	32,458	
Total revenue growth	-3.1%	75.5%	

Source: KRC Insights

For F24, we are forecasting a 75.5% YoY revenue growth driven principally by the commencement of several multi-million dollar QAPs™ contracts. In addition to plant expansion discussed above, MBX expects to convert VTM product lines to QAPs™ product lines as well.

Margins

Factoring in strong revenue growth, continued improving gross margins and an increased cost base as the company expands production and selling expenses, we forecast that EBITDA margins will approximate +36.1% for F24E (Figure 12).

Figure 12: MBX New vs Old EBITDA forecasts ($000s)

Sept. year-end	2022A	2023E	2024E
EBITDA	3,647	2,985	13,880
Margin %	19.1	16.1	42.8
Adj. EBITDA*		1,635	9,880
Margin %		8.8	30.4

Source: KRC Insights Adj EBITDA excludes impact of Sequel progress payments i.e. represents core business

Valuation

As an overview, over the past 12 months, the MBX shares have underperformed the iShares U.S. Medical Devices ETF (IHI-N), generating a 12-month return of -33.6% vs +12.3% of the ETF (Figure 13).

The decline in the MBX shares can be attributed to no recurring VTM sales and a soft FQ1/23.

IHI is a ~US$5.9bn ETF and its holdings comprise, amongst others, several MBX customers. It offers exposure to U.S. companies that manufacture and distribute medical devices and is used to express a sector view.

Figure 13: MBX share price vs iShares U.S. Medical Devices ETF (pricing at 17/7/23)

Source: Respective exchanges, KRC Insights

Our updated valuation for MBX (Figure 14) includes the following metrics:

- We base our valuation of F24 EBITDA
- We apply a 15x EV/2024E EBITDA multiple – consistent with the average of 6 of MBX's US-listed peers
- Using the fully diluted number of shares (per Figure 10), which includes the conversion of the convertible debenture, and

- We maintain our notional value for the Kinlytic urokinase (KU) asset at $10m. Please refer to our separate report in this regard.

We derive a target of $1.00 for MBX using an EV/EBITDA approach for the core business and then add $10.0m for the KU development asset.

Figure 14: MBX valuation ($000s)

		New
F2024EAdj. EBITDA*	$000s	9,880
Multiple	x	15.0x
Enterprise Value	$000s	148,204
Add: Cash 2024E	$000s	25,088
Less: Debt 20234*	$000s	2,865
Implied market cap	$000s	170,426
Kinlytic urokinase	$000s	10,000
MBX valuation	$000s	180,426
FD # shares*	000s	183,356
Target price	$	0.98
Rounded	**$**	1.00
***=assumes conversion of the CDs.**		

Source: KRC Insights

*= Adj EBITDA excludes impact of Sequel progress payments i.e. represents core business

Figure 15: MBX historical and forecast income statement ($000s)

Sept. year-end $000's	2020	2021	2022	Q1/23	Q2/23	Q3/23E	Q4/23E	2023E	2024E
Antigen products	8,688	9,082	8,288	1,004	3,005	2,512	3,508	10,028	13,492
% growth	-27.5%	4.5%	-8.7%	-43.2%	86.9%	10.0%	33.4%	21.0%	34.5%
QAPs™	1,528	4,705	5,375	1,334	1,102	1,502	4,126	6,713	14,516
% growth	40.5%	207.9%	14.3%	16.0%	-16.4%	15.0%	157.6%	24.9%	116.2%
VTM		4,507	5,004						
% growth			11.0%						
Royalties & Other	309	299	409	165	112	1,446	29	1,751	4,450
% growth	-10.4%	-3.0%	36.5%	34.2%	19.7%	1420.0%	-70.4%	328.4%	154.1%
Total Sales	10,525	18,593	19,076	2,502	4,218	5,459	6,312	18,492	32,458
Total revenue growth	-21.5%	76.7%	2.6%	-48.5%	-13.6%	8.9%	45.8%	-3.1%	75.5%
Cost of goods sold	(5,864)	(7,549)	(7,951)	(1,316)	(1,691)	(1,887)	(2,230)	(7,125)	(9,521)
Gross Margin	4,661	11,044	11,125	1,186	2,527	3,572	4,082	11,367	22,937
Selling and business development	(633)	(858)	(1,554)	(362)	(376)	(433)	(317)	(1,488)	(1,623)
General and administrative	(3,540)	(4,316)	(5,162)	(1,601)	(1,502)	(1,764)	(1,359)	(6,226)	(6,816)
Research and development	(1,013)	(1,033)	(1,799)	(425)	(526)	(569)	(392)	(1,912)	(2,110)
Total costs	(5,185)	(6,207)	(8,515)	(2,388)	(2,404)	(2,766)	(2,068)	(9,626)	(10,549)
Operating (Loss)/income	(525)	4,837	2,610	(1,202)	123	806	2,015	1,741	12,388
Interest paid	(525)	4,837	2,610	(1,202)	123	(90)	(90)	(368)	(350)
Net income before taxation	(4,659)	3,233	1,866	(1,299)	32	716	1,925	1,373	12,038
Taxation	(1,568)		(77)						
Net income	(6,228)	3,233	1,789	(1,299)	32	716	1,925	1,373	12,038
EPS - Basic	($ 0.06)	$ 0.03	$ 0.01	($ 0.01)	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.09
EPS - FD	($ 0.06)	$ 0.02	$ 0.01	($ 0.01)	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.07

	2020	2021	2022	Q1/23	Q2/23	Q3/23E	Q4/23E	2023E	2024E
Gross profit %	44.3	59.4	58.3	47.4	59.9	60.6	63.7	61.5	70.7
Operating margin %	(5.0)	26.0	13.7	(48.0)	2.9	10.0	27.8	9.4	38.2
EBITDA $000's	165	5,659	3,647	(961)	425	590	2,648	2,985	13,880
EBITDA margin %	1.6	30.4	19.1	(38.4)	10.1	14.4	34.6	16.1	42.8
Adj. EBITDA* $000's								1,635	9,880
Adj. EBITDA margin %								8.8	30.4
Effective tax rate %	(33.7)	--	4.1	--	--	--	--	--	--
Net margin %	(59.2)	17.4	9.4	(51.9)	0.7	7.8	26.6	7.4	37.1

Source: Company reports, KRC Insights *=excludes impact of KU progress payments

Appendix I: Terminology

Analyte: a substance whose chemical constituents are being identified and measured.

Antigen: An antigen is any substance that causes your immune system to produce antibodies against it. This means your immune system does not recognize the substance, and is trying to fight it off.

Bioreactor: A bioreactor is an apparatus for growing organisms (yeast, bacteria, or animal cells) under controlled conditions. Used in industrial processes to produce pharmaceuticals, vaccines, antigens or antibodies.

CE: Conformité Européene, a certification mark that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area.

CEW: Canada Emergency Wage Subsidy.

Clinical laboratory: is a healthcare facility providing a wide range of laboratory procedures which aid physicians in carrying out the diagnosis, treatment, and management of patients.

CLIA: The Clinical Laboratory Improvement Amendments of 1988 (CLIA) regulations include federal standards applicable to all U.S. facilities or sites that test human specimens for health assessment or to diagnose, prevent, or treat disease.

Epitope: specific area where a specific antibody binds with an antigen.

Immunoassays: quick and accurate tests that can be used on-site and in the laboratory to detect specific molecules.

Immunoglobulin: is the most common type of antibody in blood and other body fluids. Produced by plasma cells (white blood cells).

IVD: In vitro device (IVD) diagnostics are tests done on samples such as blood or tissue that have been taken from the human body. These are typically regulated.

Laboratory accreditation: A means of determining the technical competence of laboratories to perform specific types of testing, measurement and calibration.

LDT: A laboratory developed test (LDT) is a type of in vitro diagnostic test that is designed, manufactured and used within a single laboratory.

Microtiter plate: is a flat plate with multiple "wells" used as small test tubes. The microplate has become a standard tool in analytical research and clinical diagnostic testing laboratories.

OTF: Ontario Together Fund.

PCR: polymerase chain reaction (PCR) test.

Proficiency testing: (PT) the performance evaluations for regulatory purposes, typically applies to laboratories and their specific tests or measurements.

Quality controls: also referred as quality assessment products (QAPs™), are inactivated and stabilized samples of pathogen are created to resemble patient samples in order to support one or more of (i) the proficiency testing (PT) of labs, (ii) test development, instrument validation and technical training, or (iii) quality management of patient testing by clinical laboratories.

Roller bottle: Cylindrical in shape, a roller bottle is used to grow and store cell cultures. Placed on a roller, roller bottles are slowly rotated and bathe cells that are attached to the inner surface of the bottle. Roller bottles are typically made of plastic or autoclavable glass.

ToRCH: An acronym for a group of infections that can cause significant birth defects and even fetal death. The ToRCH test measures the levels of an expecting mother's antibodies against five groups of chronic infections: toxoplasmosis, rubella, cytomegalovirus (CMV), herpes simplex virus (HSV) and other infections.

VTM: Viral Transport Media are vials of liquids into which swabs of patient test samples are placed. VTM preserves the stability of any virus that is present until it can be tested by the clinical lab.

Disclosure

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